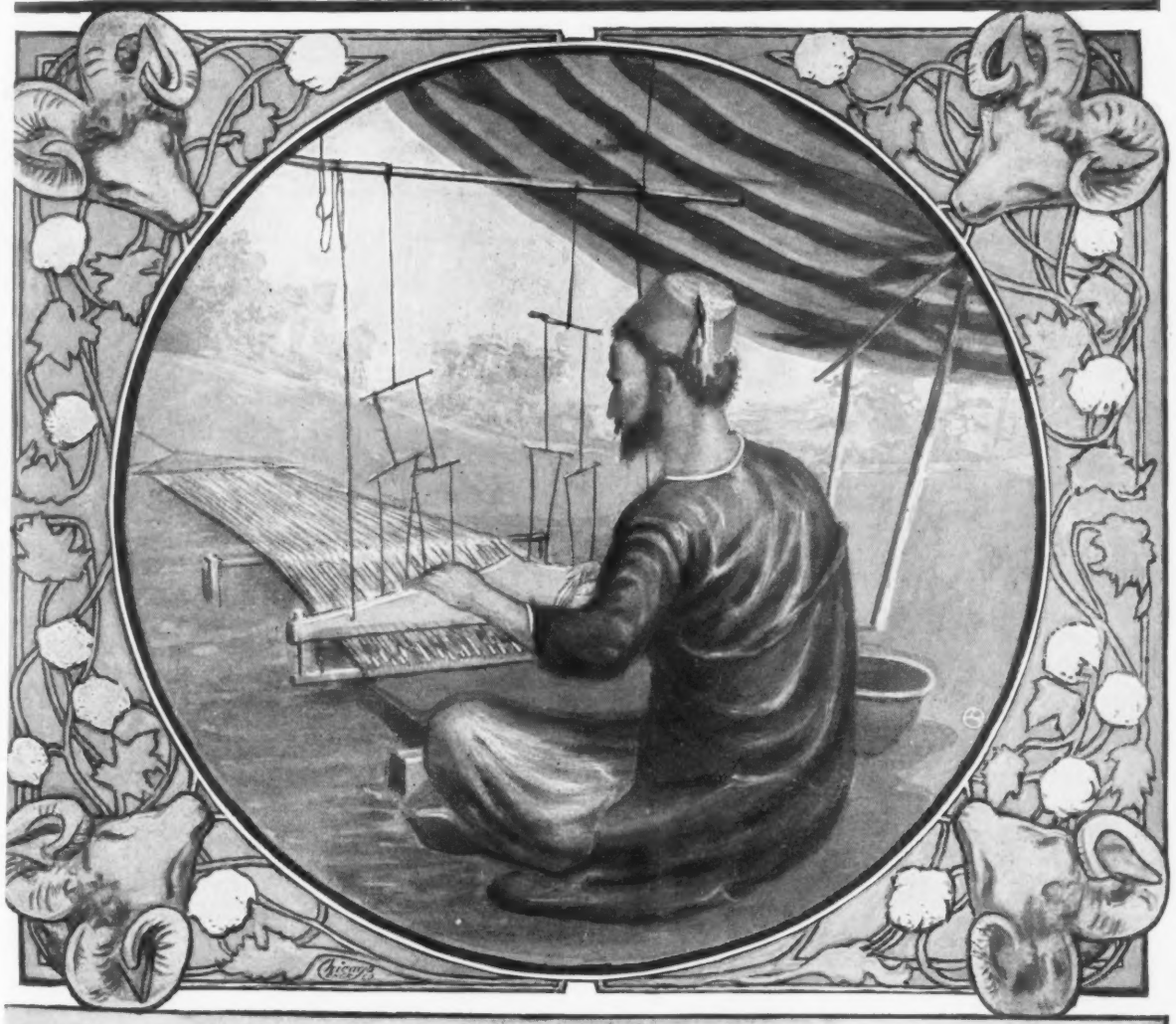
JUL 15 1911
mber 4
lume XLI

JULY 1911

$2.00 per year
$3.00 with Directory

TEXTILE WORLD RECORD



LORD & NAGLE COMPANY ~ BOSTON · MASS.

Table of Contents Page 57 Buyers Index Page 163 Index to Advertisements Page 173

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

BUILDERS OF

Bleaching, Mercerizing, Drying, Printing AND Finishing Machinery

FOR

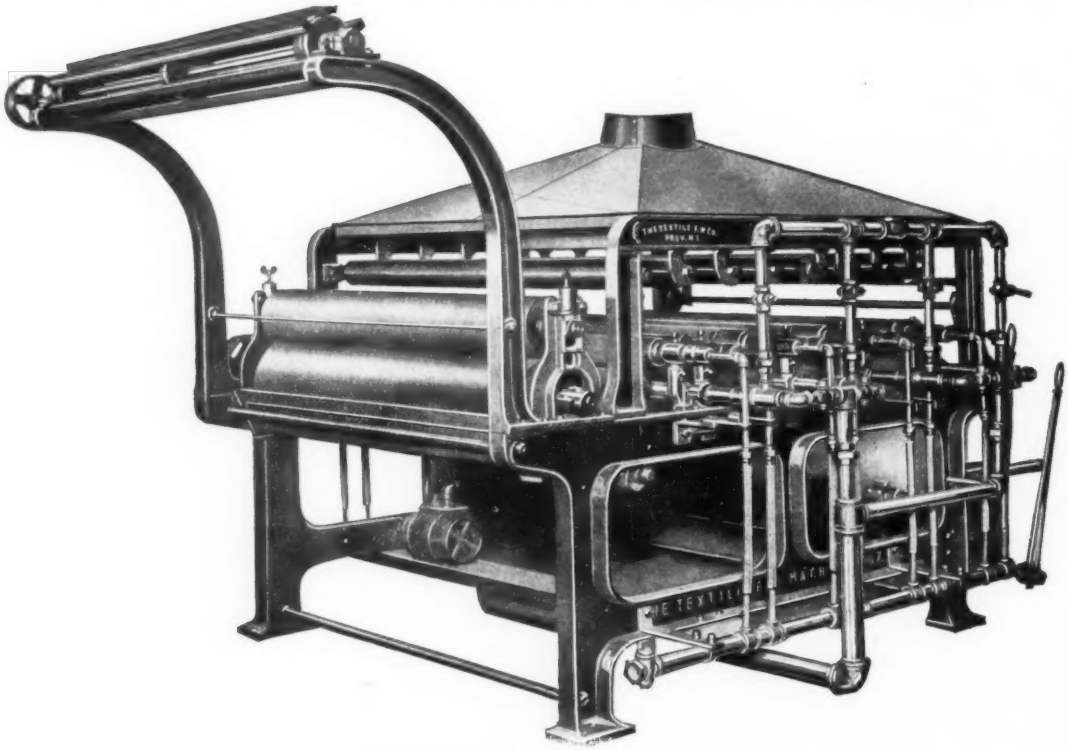
Textile Fabrics and Warps

PLANS AND ESTIMATES FOR COMPLETE PLANTS

It is impossible to fully cover the machinery we build in an advertisement or to even mention the many improvements or new machines we are constantly designing and building for the great variety of processes necessary in treating textile fabrics for the great variety of purposes to which these are put in modern life. We have expert engineers and expert textile finishers in our employ. If you will write stating as clearly as possible the class of goods you wish to finish, the amount of yards or pounds per day, the width of woven goods, etc., full information will be sent you, or one of our experts will call upon you and go over the question of equipment in person. We are the largest builders of this class of machinery in the United States.

Something new every month.

AGERS especially designed and built for running cotton goods dyed with **INDANTHRENE DYES**



4-Burner Gas Singer for Cotton Goods.

We have built all kinds of Gas Singers, 2, 3, 4, 5, and 6-burners Singers, and from 20″ to 80″ in width. We build Singers especially designed to singe

NARROW FABRICS, SILK AND WORSTED GOODS

Contents for July

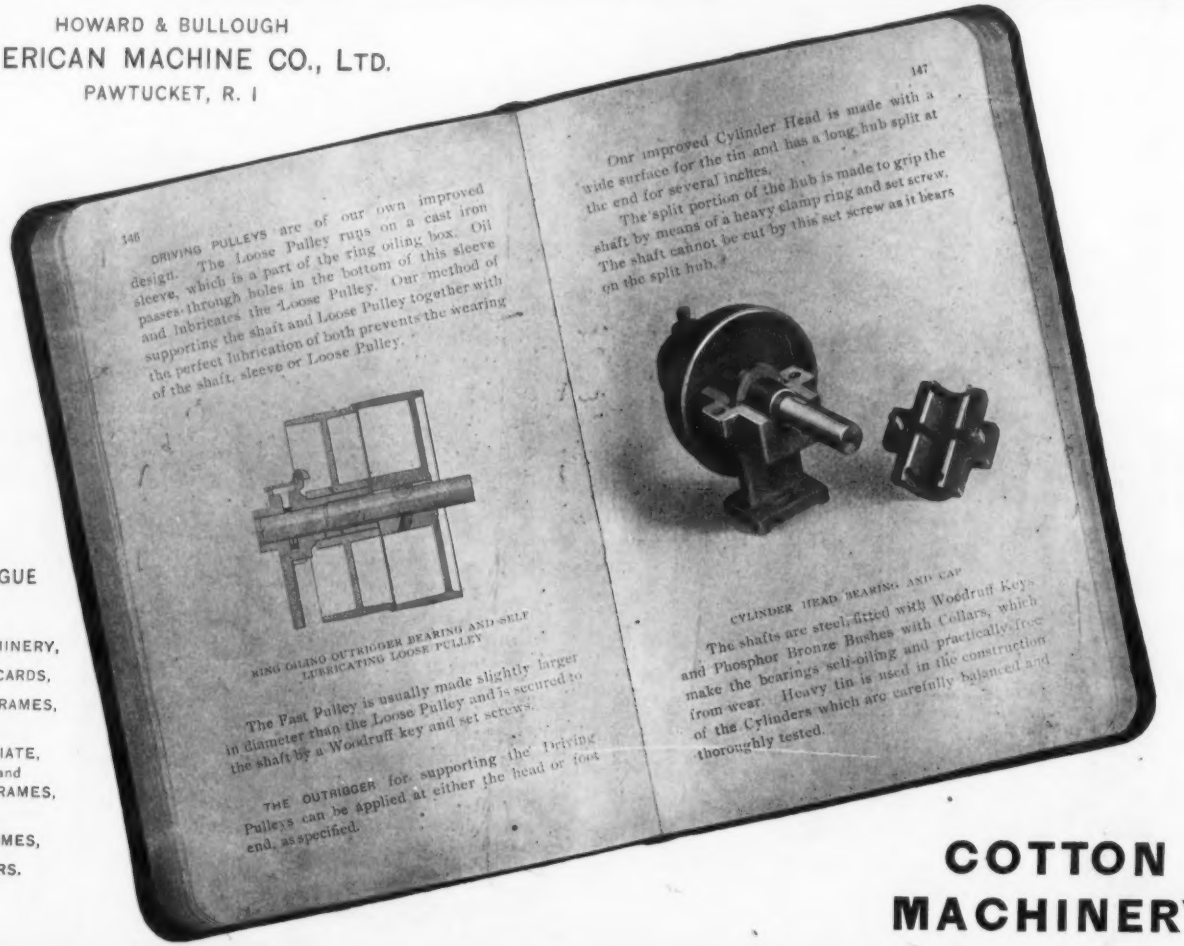
PAGE

Monthly Comment 59
The Fall River Centennial 67
How I Overcame Some Difficulties in a Finishing Room 69
The Practical Use of Concrete Constructions for Textile Mills 71
The Making of Merino Yarns 74
Correspondence and Notes 79
A Hand Book of Weaves —French Worsted Spinning—English Notes—Mill Organization—Efficiency or Scientic Management—Boiling Off Spun Silk.
Questions and Answers 99
Knitting Department 105
The Knit Goods Situation—Estimating the Cost of Knit Goods—A New Dogless Attachment for Wildman Ribbers—Applying Trade-Mark Stamps to Hosiery—The Firsching Marking Machine—Open-Work Device for Knitting Machines—A Knitted Fabric.
Dyeing, Bleaching, Printing, Etc. 116
The After Treatment of Substantive Dyes on Cotton—An Indigo Dyeing Machine for Piece Goods—Practical Dyeing—Testing the Action of Light Upon Dyed Shades—Dye Recipes.
New Machinery and Processes. 126
Personals 138
Mill News 144
New Publications 154
Business Literature 154
Industrial Notes. 155
Recent Textile Patents 160
Wool Market 195
Bradford Market 197
Cotton Market 199
Yarn Market 201
Rag and Shoddy Market. 208
Silk Market. 211
Dyestuffs and Chemicals 217
Mill Stocks 221

Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

HOWARD & BULLOUGH
AMERICAN MACHINE CO., LTD.
PAWTUCKET, R. I


146
DRIVING PULLEYS are of our own improved design. The Loose Pulley runs on a cast iron sleeve, which is a part of the ring oiling box. Oil passes through holes in the bottom of this sleeve and lubricates the Loose Pulley. Our method of supporting the shaft and Loose Pulley together with the perfect lubrication of both prevents the wearing of the shaft, sleeve or Loose Pulley.
RING OILING OUTRIGGER BEARING AND SELF LUBRICATING LOOSE PULLEY
The Fast Pulley is usually made slightly larger in diameter than the Loose Pulley and is secured to the shaft by a Woodruff key and set screws.
THE OUTRIGGER for supporting the Driving Pulleys can be applied at either the head or foot end, as specified.
147
Our improved Cylinder Head is made with a wide surface for the tin and has a long hub split at the end for several inches.
The split portion of the hub is made to grip the shaft by means of a heavy clamp ring and set screw. The shaft cannot be cut by this set screw as it bears on the split hub.
CYLINDER HEAD, BEARING, AND CAP
The shafts are steel, fitted with Woodruff Keys and Phosphor Bronze Bushes with Collars, which make the bearings self-oiling and practically free from wear. Heavy tin is used in the construction of the Cylinders which are carefully balanced and thoroughly tested.

CATALOGUE
OF
PICKING MACHINERY,
REV. FLAT CARDS,
DRAWING FRAMES,
SLUBBING, INTERMEDIATE, ROVING and JACK FRAMES,
SPINNING FRAMES,
TWISTERS.

COTTON MACHINERY

CB245831

TEXTILE WORLD RECORD

JULY, 1911

Monthly Comment.

Short Time in Cotton Mills

The continued high price of raw cotton, which has led to extensive curtailment of running time by American mills, is stimulating the International Cotton Federation to renewed exertions toward bringing the world's cotton trade into agreement on a schedule for organized short time. The general committee of this Federation met at Manchester last month with Sir C. W. Macara in the chair. Reports on short time from various countries were read, among them being the following from the United States:

United States of America.—Although the associations there are not members, they have in the past cooperated with the International Federation and have been asked to adopt organized short time. The following is an extract of a letter just received from the Arkwright Club, Boston, Mass.: "There is a considerable amount of short time already practiced and there is sure to be more during the summer. A circular has been issued to the members and the following are a few of the replies received so far: One of the largest companies in the United States reports an absolute shutdown of three weeks at intervals between now and September. Another company plans to run only about 60 per cent. of its machinery through the summer. A third—one of the Fall River mills—is running only half time and proposes to continue the policy until conditions improve. These are examples of the curtailment that is actually going on, but it is impossible to give definite statistics." There has not yet been time to receive an answer from the American Cotton Manufacturers' Association, Charlotte, N. C., but press reports show that there is also considerable stoppage of machinery and extensive short time.

Reports from other countries were as follows:

France.—Normandy: During May the mills have been stopped one day per week; during June the mills will be stopped one and a half days per week, besides Bank holiday at Whitsuntide. The Vosges: Spinning and weaving industry is stopping one day per week during three months, beginning May 15. The North: Mills are stopped one day per week during the next three months.

Italy.—Many mills are stopped entirely. A reduction of over 20 per cent. in the output of the remaining mills is taking place.

Austria.—A 25 per cent. reduction of the annual production on an organized basis is in force which must be completed by end of 1911.

Japan.—There has been in force during the last year organized curtailment of production of 27.5 per cent. on coarse yarns, 20 per cent. on fine yarns and this will be continued until at least October, 1911.

Sweden.—Individual short time is already going on and will be the rule more and more during the summer. Organized short time is being discussed.

Germany.—Unofficial reports of trade show that although full time is being run in some districts, in others short time is being extensively adopted. The official report says that the matter of organized short time is being taken up energetically and there are hopes of being successful.

Canada.—Reports are to hand to the effect that they will curtail considerably their production during the summer months.

India and some of the smaller European cotton-using countries are moving in the matter and reports will doubtless be forthcoming shortly.

We are informed by Secretary Bryant that Capt. E. A. Smyth, president of the American Cotton Manufacturers' Association, made the following report to the International Cotton Federation in June:

As far as I can judge from reports sent in to this office, 20 to 25 per cent. of the spindleage in

the Southern States is now idle, and will be until the new crop comes in.

In addition to the report of the Arkwright Club to the Federation there appeared in the Manchester Guardian a short time before the meeting of the Federation committee an abstract of an article from which we take the following extract:

Sixteen countries are affiliated in the International Cotton Federation, and of the few cotton manufacturing countries which are not actually affiliated, must cooperate. It is hoped that the United States of America, which has cooperated all along, and which is the only large cotton growing and manufacturing country not yet officially attached, will join the International Federation ere long. In that connection, Sir C. W. Macara states Major John M. Carson, the commercial agent of the United States Government called upon him recently at the request of President Taft, and conferred with him as to the best means of organizing the Cotton Employers' Association of America on the lines of the English Federation, with a view to affiliation to the international body.

There is evidently some misunderstanding here, for it is not conceivable that the President would take a hand in reorganizing our cotton associations in order to promote organized international short time, but the article shows plainly the strong desire on the part of the International Federation to include the United States among the affiliated countries.

The Indian Cotton Industry

The depression in the cotton mills of India was strongly emphasized at a recent meeting of the Bombay Millowners' Association. One speaker stated that during the past year 50 per cent. of the spinning mills of Bombay had been closed and that a number of others had given notice to their operatives. The causes of the bad trade were the high price of cotton and the failure of the goods market to advance. A number of the millowners present at the meeting expressed the belief that it was useless to attempt to stimulate this growing of Indian cotton unless the government came forward with the necessary concessions in the way of subsidies. In addition to increasing the cotton supply, the remedies for the present difficulties included organized short time, improvement in the quality of labor and the development of the home market.

English Spinners as American Planters

The Fine Cotton Spinners' and Doublers' Association held its annual meeting at Manchester last month and several of the officials made statements in regard to the recent purchase of a Mississippi cotton plantation which was to be operated by a company subsidiary to the Association. Lord Rotherham, the chairman of the meeting, said:

The terms of the new issue are in themselves of comparatively little importance compared with the objects to which the new issue will be devoted. As you will have gathered from the circulars, the bulk of the £875,000 which we expect to receive from the issue will be devoted to the purchase of £600,000 worth of 5 per cent. first mortgage gold bonds in two American cotton plantation companies, one-half the purchase being in the Triumph Plantation Company and the other half in the Lake Vista Plantation Company.

In addition to acquiring £600,000 worth of bonds, we propose to acquire a controlling interest in the common stock of both companies. This is a new departure for this Association to take, and it has roused considerable interest up and down the country. If it is carried out—and it is not problematical because it has already been carried out,—we shall have under the agreement control of two large cotton estates in the Mississippi delta amounting to 32,000 acres.

We have for several years been faced with great difficulty in obtaining a supply of long-staple American cotton. We require that cotton for a particular branch of our business where color, grade, length, strength and uniformity of staple are absolutely essential, and year by year we have had increasing difficulty in regard to this supply, and we have had to pay prices proportionately prohibitive.

But after most searching investigations on the spot by one of our vice-presidents, Mr. McConnel, and our managing director, Mr. Dixon, both of whom went a short time ago to the United States to examine into the details of this scheme, getting first-hand information, they have returned perfectly satisfied with the desirability of proceeding with the proposal. They were convinced, first, that the land which we are acquiring was of the finest possible description for our purpose; second, that it was thoroughly well adapted for growing the particular kinds of cotton which we have had trouble in obtaining; third, that the management was in exceptionally capable hands; and, fourth, that from the very outset of the acquisition of the properties the undertaking would be, so far as they could judge, a profitable undertaking.

This is not a matter of speculation or conjecture or doubt. These lands have been growing just the kind of cotton we require, and under our management and control they can be made to conform even more exactly to the requirements at which we aim. This, therefore, is not a pioneer proposal. It is not a case of our embarking on a great experiment in the way of opening up land which might or might not ultimately successfully grow

the particular kind of cotton of which we stand in need.

On the contrary, we know that in carrying through this transaction we are buying the richest possible assured land for the purpose we have in view. We know, too, of course, that because of the large increase there has been in spindleage within the last five years, an increase greatly in excess of the increased acreage of cotton which has been planted in the world, the advantage for the next few years, at any rate, will lie rather on the side of the cotton grower than on the side of the cotton spinner—will be so, in fact, until the supply of cotton is more abundant and has overtaken the demand. Under these circumstances the directors do not want the shareholders of this Association to be entirely deprived of a share in this advantage. (Applause.)

In seconding the motion for the adoption of the report, Hector Christie made the following reference to the plantation enterprise:

The chairman has spoken of the great variations which have taken place in the price of the cotton we require. You must bear in mind that a mistake made in the purchase of cotton, if it had not taken away their profits, would have materially decreased them. I look forward with satisfaction to this large new venture which they had undertaken in America. While we have other strings to our bow, cotton is the foundation of our business, and unless we can get a supply of this kind of cotton, which was to make so many kinds of yarn and which had to suit so many markets and so many customers, the business could not make the satisfactory profit to which an association like the Fine Cotton Spinners' Association was entitled with its capital and its excellent management.

No purchase or investment of the shareholders' money had ever been considered with more care, labor and thought than this American investment. It had been many times before the directors, and every possible objection had been considered. Mr. McConnel and Mr. Dixon too had been over, one might say, every single yard of the land, and they were perfectly satisfied.

Lord Rotherham then moved the declaration of a dividend of 5 per cent. on the preferred stock, and of 10 per cent. on the common stock. In seconding this motion J. W. McConnell gave some additional particulars regarding the cotton plantation:

The principal object of the purchase is to grow the particular kind of cotton which at present is grown only in this part of the world. I think it may be said in regard to every particular kind of cotton which is to be used satisfactorily for a particular purpose that it depends upon a particular part of the world to grow it. It is almost impossible to take one particular kind of cotton from one place and grow it in another. It has to be developed in a particular climate and a particular soil.

While we have no objection to experiments being made in all parts of the world, and while we wish the British Cottongrowing Association—to which we are willing subscribers—every success, that kind of experiment cannot bring immediate benefit to a cotton business such as ours. Our first object, therefore, was to take part in the growing of cotton of the kind we want and can use, and that is why we have gone to the country where this special cotton is successfully grown. The probability is that with the advantages the Association can give to the cotton growers in this particular district, the advantages of theoretical knowledge and a sufficient capital, the land will be improved very much in the future.

The chance to obtain these plantations came suddenly. I suppose that any great venture of this kind, if it is to be carried through on economical lines, has to be a sudden transaction. If it had been known that the Fine Cotton Spinners' Association were looking for land to purchase, they could take it that any desirable land would have become very dear in price. While the Association were seeking quietly to secure an interest in the growing of cotton they met, almost by accident, with American cotton-growers who, he might say without fear or contradiction, were exceptionally qualified by training and intelligence to carry on the scientific growing of cotton.

These people had the opportunity of securing a large tract of land, and they were in want of English capitalists who would find the necessary money. The visit he had made to America with Mr. Dixon had satisfied them, as far as it was humanly possible to satisfy themselves, as to the credentials of the American people they were dealing with. They had found these men to be of the highest standing and of unlimited energy and ability. They had also satisfied themselves that the land was growing cotton of the right kind, and was well known to be of enormous fertility. It was, at any rate, security for the amount of money they were asked to invest in it. Their American friends, he might say, were coming in on practically equal terms with themselves. When they had satisfied themselves of these two things they felt that they would not be doing their duty if they did not seize the opportunity of extending the foundations of the Fine Cotton Spinners' Association and assuring that its future prosperity shall not be disturbed by the growing scarcity of cotton for the needs of the world. (Applause.)

Mr. McConnell's reference to the attempt to raise cotton in the British colonies, his recognition of the fact that the American cotton-belt offers the only opportunity for obtaining immediate relief for the cotton shortage, and the approval of his views, not only by a vote, but by an investment of millions of dollars in an American cotton plantation by this the largest textile corporation in Great Britain, constitute an unqualified endorsement of the views we expressed and the

advice we gave in the following extract from our report of Sept. 20, 1910, on the Manchester Cotton Congress:

> There must be, of course, a limit even to the vast resources of the American cotton belt, and in view of the fact that the future increase in the world's requirements is practically unlimited, it may be worth while for far-seeing statesmen to encourage the extension of cotton raising in Asia and Africa where it is not now grown on a commercial scale, to build and subsidize railroads into the interior, to distribute free seed and farming tools to the natives, to hire experts to teach them how to cultivate the fiber, to guarantee a minimum price for the product, to introduce artificial irrigation, to install gins and presses, to subsidize steamships to carry the cotton to Europe, to spin, weave and finish the colonial raw material separately to determine its possibilities. This work, however, should be classed as an experiment for the benefit of a remote posterity, and as such the expense should be borne by the government and met by general taxation. There is no more justification for asking the cotton manufacturers and operatives of Europe to bear the cost of these experiments than there is for a similar request to the cotton manufacturers and operatives of the United States. The efforts of manufacturers and of all others engaged in the work of today should be directed toward producing cotton as they produce yarn and cloth, along the line of least resistance, which in the case of cotton is found in the Southern States. Not until the possibilities of raising cotton here are exhausted, and the price has been raised sufficiently high, can cotton raising in less favored districts be commercially successful.

—÷—

The "Intrinsic Difference" in Cotton Grades

In the Questions and Answers Department of this issue, there is a suggestion from the manager of a large cotton mill which points the way to the collation of data of great practical value to cotton manufacturers.

Some of the manufacturers at the Richmond convention in May asserted that the question of profit or loss in cotton manufacturing today depends upon whether the cotton is bought with good judgment or poor luck, and yet with all the care and study given to the purchase of raw cotton, there is very little data on the question of the comparative waste in working the different grades, which will aid a manufacturer to determine which grade is the most profitable for him at the "fixed" or "commercial difference" in price.

Individual mill men have gathered some of this data. The figures of one manufacturer for one test are printed in connection with the letter, but no attempt, as far as we know, has ever been seriously undertaken having for its sole object a compilation of data bearing on the real "intrinsic difference" in the different grades to the manufacturer. The suggestion that this be undertaken by the textile schools is a good one, and we hope it may bear fruit during the coming terms.

—÷—

British Weights and Measures

The question of changing British coinage, weights and measures engaged the attention of the British Imperial Conference on June 2, by reason of the following resolution introduced by Hon. E. L. Batchelor, the Australian Minister of External Affairs:

> That with a view to facilitating trade and commerce throughout the Empire the question of the advisableness of recommending a reform of the present units of weights, measures and coins ought to engage the earnest attention of this Conference.

Mr. Batchelor said it was quite impracticable for Australia or New Zealand to make any alteration in the existing system unless the United Kingdom did the same. The Hon. Sydney C. Buxton, President of the Board of Trade, said in behalf of the Home Government that he could not support the resolution because it implied that the change ought to be carried through. He stated that if they had a clean slate it would probably be an advantage to adopt a decimal system of coinage, and a metric system of weights and measures, but that was not the position. He called attention to the fact that the House of Commons had rejected a bill providing for the compulsory enforcement of the metric system, and added that it would not be practicable to introduce a new system as trade, commerce and domestic arrangements would be seriously upset.

Sir Joseph Ward, Prime Minister of New Zealand, stated that he was in accord with Mr. Batchelor; that if it was possible to start the business of the world again it would be infinitely better to have the metric and decimals system. The lapse of time, however, created difficulties that could not be removed without inflicting a great amount of injury. If New Zealand, for instance, adopted a met-

ric system, it would probably be impossible for her to carry on her business relations satisfactorily with England unless Great Britain simultaneously adopted a metric system, and he recognized there were enormous difficulties confronting England. He would like to see established uniformity of currency and coinage, but he doubted the practicability of the change suggested in the resolution. Sir E. P. Morris, Prime Minister of New Foundland, agreed with the Prime Minister of New Zealand.

As a last resort Mr. Batchelor asked whether the difficulty with regard to trade would not be largely obviated if it were decided that the metric system or the decimal system should be adopted at the expiration of ten or fifteen years. That would give sufficient time for commercial conditions to be adjusted to the change. The President of the Board of Trade, Mr. Buxton, replied that whatever date was fixed the change from the existing system must be made at a particular moment, and the disorganization of trade would arise at that particular moment whenever it was fixed. With that the resolution was withdrawn.

The Imperial Conference evidently has reached the point where its members recognize one of the reasons for not forcing the metric system on English speaking people. By continuing the study of the question they will doubtless recognize that even with a clean slate the metric system would not be the best system to adopt.

—÷—

Anthrax in Felt Mills

A recent report at the chief inspector of British factories calls attention to the large number of cases of anthrax among employes of felt mills. The proportion of cases among felt workers is much higher than among any other class of workers. As a preventative the inspector recommends the installation of dust extracting machines, which carry off the gems that cause the disease.

—÷—

The quantity of cotton consumed during the year ending August, 1910, was 4,798,953 bales, compared with 5,240,719 bales in 1909, a decrease of 8 per cent.

The Revision of Schedule K

Recent votes in the House of Representatives and Senate make it certain as anything political can be that the tariff on wool and wool goods is to be revised. The House has passed the Underwood bill by a vote of 221 to 100, 24 Republicans being recorded in favor of this Democratic measure. The Senate has overruled the once all powerful Finance Committee and placed the Underwood bill on the calendar by a vote of 39 to 18, 16 Republicans being recorded as voting with the Democrats in the affirmative. There are in fact only a few in the House and Senate who oppose the revision of schedule K, the overwhelming majority of those recorded in the negative on the two votes just mentioned conceding that revision is inevitable, but claiming that it should be delayed until next winter when the report of the Tariff Board is promised as a guide.

THE OPPORTUNITY

This state of affairs dates from the election last November when a majority of the new House of Representatives was elected pledged to tariff revision. Despite the results of that election, however, the certainty of the impending revision was not brought home to the textile trade until the Senate decided on June 21st to proceed with the work which the new House of Representatives had begun. Tariff revision is not only assured; it has ceased to be a party question. That is the situation which the textile trade is called upon to face. A number of things show that there is no occasion for a panic. The Underwood bill cannot become a law in its present form. Neither the Senate nor the President would accept it. We doubt if the House would have acepted it if there had been a prospect that it would become a law without amendment. A majority of the Senate is in favor of adequate protection to American industry. The President is also on record as in favor of such protection. When brought face to face with the responsibility of legislation the Democratic members of the House and Senate will be found opposed to any measure that is likely to injure American industry. That being the sit-

uation there is no occasion for excitement or anything approaching a panic. In fact there is much to encourage the trade to believe that an opportunity may now be presented to secure the enactment of a law revising schedule K that will be fair to both producer and consumer and thus give the trade the freedom from agitation so essential to continued prosperity.

AN AD VALOREM TARIFF

In shaping such a law in the present Congress it would probably be necessary to begin with the Underwood bill as a basis. That measure provides for ad valorem rates on both raw material and manufactured products. As far as raw materials are concerned it thus meets the strenuous and persistent objections raised by the carded woolen manufacturers to specific duties on wool and by-products. The Underwood bill abolishes all classifications of wool and by-products and applies a uniform ad valorem rate to all kinds of wool, unwashed, skirted, sorted, washed and scoured. Thus the inequalities due to the various classifications and provisos under the present law are abolished, and the raw materials for all classes of manufacturers are made subject to the same ad valorem rate.

CARPET WOOL

Objection may be raised to this arrangement by those who have advocated either a lower duty or no duty at all on carpet wool, on the ground that such wools are not produced in the United States. We believe this is a short-sighted view to take. A very large part of the wool now used in the manufacture of carpets is suited for fabrics now used for men's and women's wear. In fact there is no kind of carpet wool that cannot be used for clothing fabrics. That being true, it follows that either free carpet wool and a duty on other wools, or a lower duty on carpet wool than is imposed on other wools, will cause woolen and worsted manufacturers to use larger quantities of carpet wool in the manufacture of their products. This will increase the cost of the raw material of carpet mills by restricting what is already an inadequate supply. Thus it is to the interest of carpet manufacturers themselves to have the same ad valorem duty on all kinds of wool. Another advantage of ad valorem duties is that it will give manufacturers of both worsted and carded woolen goods access to that large quantity of heavy, shrinking wool from which they are now excluded by specific duties on wool, grease and dirt. The carded woolen manufacturers have made the demand for this reform, but it will also bring relief to the worsted spinner, who now finds the price of light shrinking wool increased above the normal market level abroad, because the specific duties confine his selections to the light shrinking lots.

THE ADMINISTRATIVE CUSTOMS LAW

The Underwood bill also provides for ad valorem rates on partly and wholly manufactured wool goods. Whether such rates can be made effective depends on the administrative customs law back of the tariff law and on the vigilance of the Treasury Department. Under existing political conditions ad valorem rates on wool goods are a necessary accompaniment of ad valorem rates on raw materials. Those who have their doubts regarding the wisdom of the former should, therefore, seek safeguards in the administrative law and in the fixing of the rates themselves.

UNDERWOOD RATES ARE TOO LOW

We believe that the Underwood rates on both raw materials and goods are too low. Our belief that the Underwood rates are too low is based on the experience under the Wilson bill sixteen years ago and on the more recent experience of Canada under the preferential tariff. The Underwood bill provides for a duty of 20 per cent. on wool and of 40 per cent. on cloths, knit goods and felts. The Wilson bill admitted wool free of duty and imposed a duty of 40 per cent. on cloths valued at not more than 50 cents a pound, and 50 per cent. on cloths valued at more than 50 cents a pound. The Canadian preferential tariff at first admitted British wool

goods at a duty of 23 1/3 per cent. Owing to the disastrous effects of the imports of wool goods on the Canadian industry this preferential rate was increased until it now stands at 30 per cent., wool, with the exception of coarse luster wool, which is subject to a duty of 3 cents a pound, being admitted free.

The effect of the Wilson law is still remembered by many of us. Large quantities of foreign wool goods were imported and the great majority of our manufacturers found themselves unable to meet this competition during the three years the law remained in force. This was under protective duties of 40 and 50 per cent. The Underwood bill on the other hand proposes to place a duty of 20 per cent. on raw wool and by-products. This requires a compensatory of 13 per cent. on goods, leaving a protection of only 27 per cent. for the manufacturer of goods. Thus the experience under the Wilson bill would seem to prove that the Underwood protection of 27 per cent. would be inadequate. The Canadian experience points in the same direction, the protection of 30 per cent. having proved inadequate for the cloth manufacturer.

CHANGES SHOULD BE GRADUAL

Even if we did not have the experience in this country and in Canada to guide us, it would be reasonably clear that the Underwood rates are too low under existing conditions. With the exception of the three years under the Wilson law wool manufacturing in this country has for forty-four years been developed under tariffs identical in all essential respects with the Payne bill. Regardless of one's opinion as to the merits or demerits of that law, few will be found to deny that it has maintained arbitrary conditions in the business of manufacturing wool goods. Our wool manufacturers and their operatives have learned and followed their trade under those conditions. Our woolen and worsted mills, the machinery and processes of manufacture, the fabrics and the raw material have all been made to conform to the same conditions. Now regardless of the results of calculations to determine the protection required, it is certain that an industry thus developed should not be exposed suddenly to conditions of even theoretically equal competition with foreign mills. The change should be made carefully and gradually so as to afford time to adjust the industry to new and unknown conditions. This course may not appeal to the radical who knows nothing about the industrial and commercial organization of the business, but it will commend itself to those who are familiar with the details of wool manufacturing, who have the public welfare in mind, and who desire to avoid not only business depression, but the reaction toward a restoration of present conditions that would inevitably follow such depression.

THE WOOL GROWERS

It is this need of giving the industry an opportunity to adjust itself to new conditions that makes it certain the Underwood rates are far too low. This consideration applies not only to wool manufacturing, but to wool growing as well. Under the present law with its specific duties foreign wool and by-products are to a large extent excluded from the country, the imports being confined to the lightest shrinking wools and more expensive by-products on which the ad valorem equivalent of the specific duty is comparatively low. This ad valorem equivalent on actual imports of wool, amounting to 49 per cent. last year, does not represent the real Payne duty. As we showed in the March, 1909, issue, the real Dingley (Payne) duty on foreign wool amounts in extreme cases to as much as 733 per cent. ad valorem, the average being approximately 70 per cent. on unwashed wool and 130 per cent. on washed and scoured wool. Such duties should not be continued in force. But growing wool and manufacturing wool goods have been developed under them, and for that reason we believe it is not advisable to reduce them at one stroke to 20 per cent. ad valorem. The tariff on wool goods supplies a parallel case. The compound duties amount in extreme cases to 150 per cent. or more, the imports being confined to the more expensive goods. These high rates have contributed greatly toward

arousing the present popular dissatisfaction with the Payne tariff. The business of manufacturing wool goods has, however, been developed under them, and for that reason it would be disastrous to reduce them at one stroke to a protective rate of 27 per cent.

FOREIGN AND DOMESTIC COST

The radical change proposed by the Underwood bill is illustrated by some calculations that have recently been published. The report on the Underwood bill contained an estimate of cost of production of wool cloths. The published estimate adds the Underwood duty with the following result:

Material	60%
Labor	25
Interest and depreciation	7½
Other charges	7½
Duty	100
Underwood duty	40
Cost landed in U. S.	140

The published calculation also gives the Underwood estimate increased in accordance with the ratios between foreign and domestic cost as given by Julius Forstmann, of the Forstmann & Huffmann Co., Passaic, N. J., the result being as follows:

Material	72%
Labor	56¼
Interest and depreciation	12
Other charges	12
Domestic cost	152¼

In other words, foreign cloths under the Underwood rates would cost landed 140 per cent. of the present foreign cost, as compared with a cost of 152 1/4 per cent. in American mills. We will not quarrel with these figures, although what the Underwood report offers as the American cost is taken as the foreign cost, while nothing is allowed for charges on imported goods and the ratios represent the experience of but one manufacturer. Overlooking these discrepancies let the estimates be accepted as showing what we believe, namely, that the Underwood rates are too low, and let us apply the same method of calculation to the Payne bill. The ad valorem equivalents of the Payne rates vary widely. On goods valued at 41 cents a pound the duty is 64 cents or 156 per cent. But for our calculation we will take the ad valorem equivalent of the duties actually collected on cloths imported last year, which was 97 per cent., and then we have the following result:

Material	60%
Labor	25
Interest and Depreciation	7½
Other charges	7½
	100
Payne duty	97
Cost landed in U. S.	197

WANTED, AN ADEQUATE AND REASONABLE TARIFF

The political history of the past half century demonstrates that the American people are in favor of adequate protection to American industries. The history of the past two years demonstrates as plainly that they want this protection, not only adequate, but reasonable. The Underwood rates are inadequate. The people have evidently made up their minds that the Payne rates are unreasonable. That being the situation it is the plain duty of the people's representatives in Congress to get together as speedily as possible on a bill that will be adequate and reasonable in order that the protective policy may be maintained and the business of manufacturing wool goods in this country may be carried on under stable conditions without discrimination against any class of manufacturers, worsted or carded woolen, without even the appearance of burdening the consumer, and without danger of exposing the American workers to injurious competition with the cheap labor of foreign countries. This is the course of reason and common sense. Will the textile trade unite and cooperate with the law makers at Washington in the work of placing on the statute book a law that will satisfy the public and provide adequate protection for this great industry?

THE FALL RIVER CENTENNIAL

Fall River has enjoyed a most successful Cotton Carnival, which was arranged by the Merchants' and Manufacturers' Association to commemorate the one hundredth anniversary of the beginning of cotton manufacturing in that city.

The first mill was built by Col. Joseph Durfee, who won his military title during the revolutionary war as an officer of a company of minute men who were organized for the defense of this section of the colonies.

In May, 1778, the British soldiers made a landing for the purpose of making a raid in Fall River and vicinity, but received such a warm reception by the minute men led by Col. Durfee that they were forced to retire to their boats in the bay. The location of the "Old Mill" is at the corner of South Main and Globe Streets, and when built was in the town of Tiverton in the State of Rhode Island, but is now a part of the city of Fall River.

By building a dam across a small stream which flows from Laurel Lake, power was secured to drive a water wheel of the tub wheel type which was afterwards superseded by a breast wheel.

There were about 500 spindles in this first mill, spinning a coarse yarn. There was no weaving done at the mill for this was before the day of the power loom. All the operatives were of native birth, and worked long hours for what would now be considered small wages. The yarn spun was woven on hand looms in the homes of the farmers of the neighborhood and was sold direct to the stores.

A VIEW OF SOME OF THE FALL RIVER STREET DECORATIONS. THE CENTENNIAL ARCH.

The raw cotton came from Charleston and Savannah in sloops and other small sailing vessels. At the time what little cotton was grown in the South was raised close to the seaboard, as the only method of cheap transportation in those days was by water.

From this humble beginning of about 500 spindles Fall River has had a marvelous growth in cotton manufacturing, for at this time she has over 4,000,000 spindles and

uation there is no occasion for excitement or anything approaching a panic. In fact there is much to encourage the trade to believe that an opportunity may now be presented to secure the enactment of a law revising schedule K that will be fair to both producer and consumer and thus give the trade the freedom from agitation so essential to continued prosperity.

AN AD VALOREM TARIFF

In shaping such a law in the present Congress it would probably be necessary to begin with the Underwood bill as a basis. That measure provides for ad valorem rates on both raw material and manufactured products. As far as raw materials are concerned it thus meets the strenuous and persistent objections raised by the carded woolen manufacturers to specific duties on wool and by-products. The Underwood bill abolishes all classifications of wool and by-products and applies a uniform ad valorem rate to all kinds of wool, unwashed, skirted, sorted, washed and scoured. Thus the inequalities due to the various classifications and provisos under the present law are abolished, and the raw materials for all classes of manufacturers are made subject to the same ad valorem rate.

CARPET WOOL

Objection may be raised to this arrangement by those who have advocated either a lower duty or no duty at all on carpet wool, on the ground that such wools are not produced in the United States. We believe this is a short-sighted view to take. A very large part of the wool now used in the manufacture of carpets is suited for fabrics now used for men's and women's wear. In fact there is no kind of carpet wool that cannot be used for clothing fabrics. That being true, it follows that either free carpet wool and a duty on other wools, or a lower duty on carpet wool than is imposed on other wools, will cause woolen and worsted manufacturers to use larger quantities of carpet wool in the manufacture of their products. This will increase the cost of the raw material of carpet mills by restricting what is already an inadequate supply. Thus it is to the interest of carpet manufacturers themselves to have the same ad valorem duty on all kinds of wool. Another advantage of ad valorem duties is that it will give manufacturers of both worsted and carded woolen goods access to that large quantity of heavy, shrinking wool from which they are now excluded by specific duties on wool, grease and dirt. The carded woolen manufacturers have made the demand for this reform, but it will also bring relief to the worsted spinner, who now finds the price of light shrinking wool increased above the normal market level abroad, because the specific duties confine his selections to the light shrinking lots.

THE ADMINISTRATIVE CUSTOMS LAW

The Underwood bill also provides for ad valorem rates on partly and wholly manufactured wool goods. Whether such rates can be made effective depends on the administrative customs law back of the tariff law and on the vigilance of the Treasury Department. Under existing political conditions ad valorem rates on wool goods are a necessary accompaniment of ad valorem rates on raw materials. Those who have their doubts regarding the wisdom of the former should, therefore, seek safeguards in the administrative law and in the fixing of the rates themselves.

UNDERWOOD RATES ARE TOO LOW

We believe that the Underwood rates on both raw materials and goods are too low. Our belief that the Underwood rates are too low is based on the experience under the Wilson bill sixteen years ago and on the more recent experience of Canada under the preferential tariff. The Underwood bill provides for a duty of 20 per cent. on wool and of 40 per cent. on cloths, knit goods and felts. The Wilson bill admitted wool free of duty and imposed a duty of 40 per cent. on cloths valued at not more than 50 cents a pound, and 50 per cent. on cloths valued at more than 50 cents a pound. The Canadian preferential tariff at first admitted British wool

goods at a duty of 23 1/3 per cent. Owing to the disastrous effects of the imports of wool goods on the Canadian industry this preferential rate was increased until it now stands at 30 per cent., wool, with the exception of coarse luster wool, which is subject to a duty of 3 cents a pound, being admitted free.

The effect of the Wilson law is still remembered by many of us. Large quantities of foreign wool goods were imported and the great majority of our manufacturers found themselves unable to meet this competition during the three years the law remained in force. This was under protective duties of 40 and 50 per cent. The Underwood bill on the other hand proposes to place a duty of 20 per cent. on raw wool and by-products. This requires a compensatory of 13 per cent. on goods, leaving a protection of only 27 per cent. for the manufacturer of goods. Thus the experience under the Wilson bill would seem to prove that the Underwood protection of 27 per cent. would be inadequate. The Canadian experience points in the same direction, the protection of 30 per cent. having proved inadequate for the cloth manufacturer.

CHANGES SHOULD BE GRADUAL

Even if we did not have the experience in this country and in Canada to guide us, it would be reasonably clear that the Underwood rates are too low under existing conditions. With the exception of the three years under the Wilson law wool manufacturing in this country has for forty-four years been developed under tariffs identical in all essential respects with the Payne bill. Regardless of one's opinion as to the merits or demerits of that law, few will be found to deny that it has maintained arbitrary conditions in the business of manufacturing wool goods. Our wool manufacturers and their operatives have learned and followed their trade under those conditions. Our woolen and worsted mills, the machinery and processes of manufacture, the fabrics and the raw material have all been made to conform to the same conditions. Now regardless of the results of calculations to determine the protection required, it is certain that an industry thus developed should not be exposed suddenly to conditions of even theoretically equal competition with foreign mills. The change should be made carefully and gradually so as to afford time to adjust the industry to new and unknown conditions. This course may not appeal to the radical who knows nothing about the industrial and commercial organization of the business, but it will commend itself to those who are familiar with the details of wool manufacturing, who have the public welfare in mind, and who desire to avoid not only business depression, but the reaction toward a restoration of present conditions that would inevitably follow such depression.

THE WOOL GROWERS

It is this need of giving the industry an opportunity to adjust itself to new conditions that makes it certain the Underwood rates are far too low. This consideration applies not only to wool manufacturing, but to wool growing as well. Under the present law with its specific duties foreign wool and by-products are to a large extent excluded from the country, the imports being confined to the lightest shrinking wools and more expensive by-products on which the ad valorem equivalent of the specific duty is comparatively low. This ad valorem equivalent on actual imports of wool, amounting to 49 per cent. last year, does not represent the real Payne duty. As we showed in the March, 1909, issue, the real Dingley (Payne) duty on foreign wool amounts in extreme cases to as much as 733 per cent. ad valorem, the average being approximately 70 per cent. on unwashed wool and 130 per cent. on washed and scoured wool. Such duties should not be continued in force. But growing wool and manufacturing wool goods have been developed under them, and for that reason we believe it is not advisable to reduce them at one stroke to 20 per cent. ad valorem. The tariff on wool goods supplies a parallel case. The compound duties amount in extreme cases to 150 per cent. or more, the imports being confined to the more expensive goods. These high rates have contributed greatly toward

arousing the present popular dissatisfaction with the Payne tariff. The business of manufacturing wool goods has, however, been developed under them, and for that reason it would be disastrous to reduce them at one stroke to a protective rate of 27 per cent.

FOREIGN AND DOMESTIC COST

The radical change proposed by the Underwood bill is illustrated by some calculations that have recently been published. The report on the Underwood bill contained an estimate of cost of production of wool cloths. The published estimate adds the Underwood duty with the following result:

Material	60%
Labor	25
Interest and depreciation	7½
Other charges	7½
Duty	100
Underwood duty	40
Cost landed in U. S.	140

The published calculation also gives the Underwood estimate increased in accordance with the ratios between foreign and domestic cost as given by Julius Forstmann, of the Forstmann & Huffmann Co., Passaic, N. J., the result being as follows:

Material	72%
Labor	56¼
Interest and depreciation	12
Other charges	12
Domestic cost	152¼

In other words, foreign cloths under the Underwood rates would cost landed 140 per cent. of the present foreign cost, as compared with a cost of 152 1/4 per cent. in American mills. We will not quarrel with these figures, although what the Underwood report offers as the American cost is taken as the foreign cost, while nothing is allowed for charges on imported goods and the ratios represent the experience of but one manufacturer. Overlooking these discrepancies let the estimates be accepted as showing what we believe, namely, that the Underwood rates are too low, and let us apply the same method of calculation to the Payne bill. The ad valorem equivalents of the Payne rates vary widely. On goods valued at 41 cents a pound the duty is 64 cents or 156 per cent. But for our calculation we will take the ad valorem equivalent of the duties actually collected on cloths imported last year, which was 97 per cent., and then we have the following result:

Material	60%
Labor	25
Interest and Depreciation	7½
Other charges	7½
	100
Payne duty	97
Cost landed in U. S.	197

WANTED, AN ADEQUATE AND REASONABLE TARIFF

The political history of the past half century demonstrates that the American people are in favor of adequate protection to American industries. The history of the past two years demonstrates as plainly that they want this protection, not only adequate, but reasonable. The Underwood rates are inadequate. The people have evidently made up their minds that the Payne rates are unreasonable. That being the situation it is the plain duty of the people's representatives in Congress to get together as speedily as possible on a bill that will be adequate and reasonable in order that the protective policy may be maintained and the business of manufacturing wool goods in this country may be carried on under stable conditions without discrimination against any class of manufacturers, worsted or carded woolen, without even the appearance of burdening the consumer, and without danger of exposing the American workers to injurious competition with the cheap labor of foreign countries. This is the course of reason and common sense. Will the textile trade unite and cooperate with the law makers at Washington in the work of placing on the statute book a law that will satisfy the public and provide adequate protection for this great industry?

THE FALL RIVER CENTENNIAL

Fall River has enjoyed a most successful Cotton Carnival, which was arranged by the Merchants' and Manufacturers' Association to commemorate the one hundredth anniversary of the beginning of cotton manufacturing in that city.

The first mill was built by Col. Joseph Durfee, who won his military title during the revolutionary war as an officer of a company of minute men who were organized for the defense of this section of the colonies.

A VIEW OF SOME OF THE FALL RIVER STREET DECORATIONS. THE CENTENNIAL ARCH.

In May, 1778, the British soldiers made a landing for the purpose of making a raid in Fall River and vicinity, but received such a warm reception by the minute men led by Col. Durfee that they were forced to retire to their boats in the bay. The location of the "Old Mill" is at the corner of South Main and Globe Streets, and when built was in the town of Tiverton in the State of Rhode Island, but is now a part of the city of Fall River.

By building a dam across a small stream which flows from Laurel Lake, power was secured to drive a water wheel of the tub wheel type which was afterwards superseded by a breast wheel.

There were about 500 spindles in this first mill, spinning a coarse yarn. There was no weaving done at the mill for this was before the day of the power loom. All the operatives were of native birth, and worked long hours for what would now be considered small wages. The yarn spun was woven on hand looms in the homes of the farmers of the neighborhood and was sold direct to the stores.

The raw cotton came from Charleston and Savannah in sloops and other small sailing vessels. At the time what little cotton was grown in the South was raised close to the seaboard, as the only method of cheap transportation in those days was by water.

From this humble beginning of about 500 spindles Fall River has had a marvelous growth in cotton manufacturing, for at this time she has over 4,000,000 spindles and

100,000 looms spinning from the coarsest of cloth to the finest lawns, ginghams, and Jacquard weaves.

A grand exposition was held in the State Armory and among the most striking exhibits were those displayed by the famous cloth printing establishments, the American and Algonquin. The King Philip mills, Davis mills, Stevens, Barnaby and many others had beautiful displays of their goods. The Bradford Durfee Textile School, which is just across the street from the Armory, gave a practical demonstration of the carding, spinning and weaving of a wide variety of cotton goods and was one of the most attractive points, being visited by many thousands of people, many of whom had never had the opportunity to observe this work being done by the most improved methods.

Friday was "President's Day" and was the most popular day of the week. President Taft arrived on the Mayflower about 2 p. m. and landed at the dock of the Iron Works Cotton Mills where his party was met by the Carnival committee and taken in automobiles for a tour of the city. Beside President Taft there were present Senator Crane, Gov. Foss, Cong. Greene and a number of naval and army officers. After touring the city the Presidential party visited the exposition in the armory and then the Textile school, where all the machines used in the manufacture of cloth from the bale to the finished goods were in operation. This was the first time the President had ever seen this process of cotton manufacturing and he expressed much interest in what he saw.

From the school the President was escorted by a large military parade to the South Park where he gave a short address, after which he was taken to the yacht Mayflower and left for Providence.

Perfect weather was enjoyed the whole week and the immense crowds seemed to enjoy every feature.

The slogan of the city is, "Fall River Looms Up," and this was certainly true during the Cotton Carnival.

The number of flax spindles in Germany is estimated at 330,000 and of mechanical looms at 20,000 to 25,000.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay of course for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

How I Overcame Some Difficulties in a Finishing Room

BY WALTHER

Some years ago while occupying my first position as superintendent, we got into a difficulty that for some time threatened to prove serious. We had been running very smoothly on a nice line of flannels and homespuns, and the time had come to plan our work for the next season. Our salesman was confident that a line of venetians, or as he termed it, an imitation covert, would be a good seller. We made the samples of single mixture warp and plain filling which finished up very nicely and proved to be popular. The orders came in freely and we congratulated ourselves that we were to have an easy time, as there were only three shades sold, which simplified matters all through the mill.

We soon had the stock colored, the mixture on the cards and yarn spooled for the dressers. We put up stock sufficient for twenty pieces, which we dressed into four warps. The boss weaver was instructed to get these into the looms as quickly as possible that we might get sample pieces finished without delay. We used good stock, spun to 5 run warp and 5 1/4 run filling, making a nice smooth thread, strong and elastic. The first four pieces were sent to the finishing room with a rush ticket, which gave them the preference over everything else, and the finisher was told to send for the superintendent as soon as the goods were ready for the perch.

We were confident that everything was as perfect as could be, and notified our customer that he would have the samples in a couple of days. On the afternoon of the day they were to go out I went down to the finishing room and saw the sample pieces on the press. They appeared to be giving some trouble and on making inquiry of the finisher, he stated that they acted as if they were not clean, although they were free from odor. After pressing they were pulled over the perch for examination. They looked fairly well, but did not have the bright, snappy appearance of the first samples, nor did they handle as well. On looking through them toward a strong light, they had a mottled appearance, as if they had been on a dirty, wet floor, but this did not show when on the regular examining perch. After some discussion as to the probable cause of the trouble, we decided to try another set, fulled with a heavier soap, and arranged that the finisher and myself would see them put into the fulling mill and started, to make sure that they were properly handled.

A new batch of soap was made and every possible precaution taken to have this set come out right. Meanwhile I had been doing a little investigating and was sure I had located the trouble in another department. Going to the picker room, I had a new lot laid down, oiled and picked, under my personal supervision. This was sent to the carder with instructions to put it on two sets and get the warp made in a hurry. The yarn was spun, spooled and dressed into two warps in record time and two looms were ready to receive them when they were drawn in. We ran the looms overtime in order to get the pieces off as soon as possible and the next day we had two special pieces for the finisher who was also instructed to rush them through and let me know when they were ready for the mill.

Next morning I was asked to go to the fulling room, and found the finisher there with the two special pieces. They were run into the mill, soaped and started. After running about five minutes we looked at them and decided that this sample would be all right, while the two on the other side of the mill, from the original lot, would prove to be as bad as the first set. About four o'clock that day the pieces were ready for the press. We went down, pulled them over the perch and found them to be first-class, and started them on the press. While they were running through I sent for the owner, to the surprise

of the finisher, who asked, "Don't you want to perch them after pressing, before he sees them?" I told him I knew they were all right. As soon as the owner came down, we put them over the perch, compared them with the sample and found them to be far superior. The two pieces from the original lot were then put on the perch and turned out to be as bad as the first set. The finisher insisted that they had all received the same treatment. I then gave my opinion of the trouble which was laughed at by the owner, who said, "Why, I have bought the same oil from this concern for ten years, and there is nothing wrong with it. If this is the case, how do you account for two perfect pieces and two poor ones?" I called his attention to the fact that a few weeks before a sample barrel had come which had never been tried. The original lot was oiled with our regular oil, while the sample barrel was used on a special lot. To convince him we went to the picker room, moistened a handful of wool with each kind of oil, took it to the fulling room and gave it a thorough soaping. Working it in the hands a little, the wool moistened with the sample oil lathered up like shaving soap, while that moistened with the old oil seemingly ran a stream of dirty water, and required four soapings before we could get even a fair suds.

Returning to the office, the owner wrote rather a sharp letter complaining of the oil, which brought the salesman down the next day. I took him into the mill, showed him the goods and told him I considered the oil at fault. Naturally he did not wish to be convinced of anything of the kind, and left, saying he would be back in a day or two with someone to help us out. Next day a barrel of soap arrived, followed next day by the salesman and a friend who proved to be a soap maker, whose object was to solve our difficulty. I took them to the finishing room, introduced them to the finisher, asking him to give them all the assistance he could in making their experiment.

Noticing the soap which had come the previous day, the salesman remarked, "There's the soap that will do the work all right." The soap was boiled in a clean tank according to the maker's formula and under his supervision. Late in the afternoon word was brought that they were ready to full a set of pieces. The fulling mill was given a good cleaning and four pieces brought, two of the original lot and two of the special. They were run into the mill, carefully soaped. After a few minutes' run we pulled them out far enough to get a good look at them. I was curious to see how the new soap worked, but could see no material difference in the pieces, from those fulled with our own soap I expressed the opinion that the two specials would finish O. K. and the regulars be as bad as our former trials. This seemed to nettle the salesman, who stated that the finished pieces would tell the story.

Leaving the finisher to take care of the pieces, we went to the picker room where I had a new barrel of the salesman's oil opened, and an emulsion made by him, with which we moistened a small lot of wool. After asking him to bring a little of this wool with him, I took some wool oiled with the sample, and the soap maker took some clean, dry wool and we returned to the fulling room. We each soaped part of our wool with our old soap and part with the new, the result in each case being the same with either soap. Dry wool or that oiled with the sample gave a fine lather with both soaps, while that treated with the salesman's oil gave nothing but a stream of dirty water. The soap maker shook his head saying, "I can't help you any, the trouble is not in the soap." We used a wool oil similar to the sample barrel from that time on and had no more trouble in the finishing room that season.

INCREASING THE PRODUCTION OF CARDS

Editor Textile World Record:

I believe that a large increase in the production of woolen cards can be obtained by using the wire that now runs empty from the time the cylinder leaves the doffer until it returns to the feed rolls. It is my belief that an arrangement which will utilize this waste space will increase the production of the card at least 50 per cent. In order to do this it will be necessary to raise the arch so

that the stock can be fed to the card and taken from the card at points as near the bottom of the card as possible. The space thus gained could be filled with workers and strippers, increasing the carding service and the production of the machine.

Progressive.

THE PRACTICAL USE OF CONCRETE CONSTRUCTION FOR TEXTILE MILLS

By FRED S. HINDS, Mill Engineer

(Continued from May)

Eighth. Sanitary, vermin proof and waterproof floors. There is no question but what concrete floors are more sanitary than any other type of construction, commonly used in textile mills. If sanitary, they are bound to be vermin-proof as there are no spaces or openings where vermin can enter.

The floors are fairly waterproof but can be treated to make them entirely so in any case where it is desired.

Granolithic floors, when properly treated, will not dust. The writer had a very fine opportunity to investigate and found proofs which will show that the question of raising dust is only a poor argument against the use of concrete.

In a piano factory finished with granolithic floors, which were not properly treated, they had some little trouble in keeping the floors dustless. If the specifications with reference to the composition of the granolithic surface had been carried out, there would have been no trouble, as it should have been a very rich make of concrete. Therefore, to eliminate the trouble, tests were made of a new section of the floor, as it should have been laid in accordance with the specifications. Common black oil was used and it had its effect. The writer was shown a section of the floor where a piano had been rolled over the spot two thousand times and the surface was not in the least effected.

Throughout all our textile mill departments there is more or less oil that drips from the machinery, shafting, etc., and with this oil spreading over the granolithic surface, closing the pores and becoming hardened, how is it possible to have any difficulty from the dusting of the concrete, as this oiling is going on continually. Some will raise the question whether this oil will not disintegrate the concrete. It has been proven that mineral oil will not harm concrete.

If a mill owner desires to have the top of a new floor finished, there are a number of firms who manufacture a coating that can be applied for the sake of eliminating any trouble from the dust.

Trucking in a mill cannot be dispensed with, but iron wheels on these trucks can be substituted by wood wheels with hard rubber tires or usual iron wheels changed in pattern to admit the use of hard rubber tires.

Ninth. Concrete becomes stronger with age and the cost of maintenance is practically eliminated. Careful scientific tests show that when the concrete has become thoroughly set it has increased very materially in strength and when it has set for six months, the increase is 50 per cent. and over. It does not stop here, but goes on increasing in strength as the concrete increases with age.

All other building materials begin to decay or decline soon after erection or in the course of time and then the maintenance cost begins and increases as time goes on.

This is not true with concrete buildings, as all members of the construction are thoroughly tied together with the reinforcing steel bars incased in the concrete at the time of molding or casting the concrete beams.

Lest we forget, the reader is asked to remember that a concrete building is like one solid stone, or a monolith with large holes cut into same for the various stories and the outside windows.

Tenth. Resists to a high degree the vibration of high speed machinery and vibrating looms. In all our standard mill construction there are no brackets or bracing whatever. We depend entirely upon the extra thick walls to resist the vibration, having no bracing at either the columns or the walls, simply depending upon how plumb the columns and walls can be erected and then build very thick brick walls to resist the vibration. In mills erected in reinforced concrete a system

of brackets is introduced from columns to beams supported above and also from side walls at beam supports. These brackets or braces are also reinforced as in the case of beams and columns and become a part of the structure, thus the whole structure is braced from side to side and, if desired, from end to end, as the columns can be finished with four brackets, one on each side of column.

To this should be added the fact that concrete beams and floors are more rugged and have greater weight than wood floors. This also assists to resist the vibration of looms and other machinery, particularly as it is all tied together in the most thorough manner with the steel reinforcing bars.

The junction of the beams and the columns are tied, first through the brackets at the top of the columns directly into the beams, and then the bars in the beams passing from one beam through the column and down into the end of the adjoining beam enough to make a tie and vice versa, the rods passing each other and down into the opposite beam for an anchorage, thus eliminating the common joint between the timbers over the columns with only a very ordinary tie.

Eleventh. Rigid floors will prolong the life of machinery. Those who have observed the machinery as set up in mills on the common plank floor and top flooring must have been impressed by the insufficient foundation for the machinery when in operation.

Take the automatic loom or any other high-speed machine throughout the mill and set it on a rigid foundation and will not the life of the machine be prolonged? The automatic loom is composed of many parts and more delicate in operation than the common loom. Would not this run more steadily and resist the vibration resulting from the operation of the ley, if it stood upon a firmer foundation? Referring again to article 4, citing the high speed of English looms standing on flag stone. Does not the high speed illustrate the advantage of a rigid foundation. Therefore, I claim that the "wear and tear" on these looms will be considerably reduced and their life prolonged. Also, in a way, reduce the repairs always incident to a machine of many parts.

Take the revolving flat card, while not a high speed machine, the surface of its card clothing is going at a good speed and to give efficient service must be kept in very careful alignment to secure the close space between them, essential to good carding. This can be better secured on rigid and level floors rather than on the sagging plank floors and hard pine timbers, thus insuring the life of the card clothing.

Next, in the card room, the long roving frames with their hundreds of flyers running at high speed would have their life increased by a greater steadiness when starting up and when running.

Again the life of the machinery is increased by better alignment of the frames which usually run lengthwise of the mill, spanning two to three bays. These require constant shimming at foot of frames if they are to be kept level.

In the spinning room, the thousands of spindles running from six to ten thousand revolutions per minute would have greater steadiness and more free from vibration if their frames stood on concrete floors. It would also insure a much better and truer alignment of the long frames usually spanning three mill bays.

The weaving department has been gone into detail throughout this paper, setting forth the advantages of rigid floors in this special department where so much vibration has been one of the sources of annoyance to manufacturers.

Twelfth. Saving in power. Some readers will say that this is a time worn subject, but remember the cost of fuel is increasing each year and must be kept in mind. Take the weaving department as an example.

Consider the comparison; a loom "dancing" on common mill floor plank and one standing on a rigid level concrete floor. Will not the slip in the belt be greater down to the loom which stands on plank than one which stands on the rigid floor? Will not the slip be increased as the floor beams supporting the shafting above deflect under the weight of the floor above? Until the beams

get their permanent set it involves the expense of shortening all slipping belts, which cost time and loss of product.

The poor alignment of shafting is most commonly due to deflecting floor beams. There is exceedingly slight deflection in concrete beams and concrete floor slabs, and as all floors keep their true level in the permanent set of the concrete, it will be seen how perfect an alignment can result for both shafting and machinery.

Thirteenth. Cost of concrete mill buildings. The cost of reinforced concrete mills is practically the same as mill construction, when we consider the loads it will support, the enlarged window area obtainable and the fifteen following advantages.

1. Its strength and rigidity of construction.
2. Easily supports the light load of textile machinery.
3. The cost of fire insurance on buildings and contents is less than mill construction.
4. Less waste, thus greater production of goods that result from steady running machinery and better light.
5. The largest percentage of increase in window area.
6. Rapidity of construction.
7. Heat resisting qualities.
8. Sanitary and vermin proof. Waterproof floors.
9. Becomes stronger with age.
10. Resists the vibration of high speed machinery.
11. Prolongs the life of machinery.
12. Saving in power.
13. Its low cost of construction, all things considered.
14. Absolutely fireproof construction.
15. Flexibility when making additions to plants.

Fourteenth. Absolutely fireproof construction, as demonstrated in recent fires and by practical tests by experts.

It ranks with the best fire proof materials and this quality, no doubt, more than any other is directly responsible for the most rapid and enormous increase in the last few years in the construction of factory buildings throughout the country.

Intense heat injures the surface of the concrete but, as a very good non-conductor of heat if sufficiently thick, it provides ample protection for the steel reinforcement and the interior of the mass is unaffected even in very severe fires.

In the Baltimore and San Francisco conflagrations there were many cases where so called fire proof buildings were seriously damaged. But buildings with reinforced concrete frames passed through the great fire at Baltimore practically uninjured.

A few reinforced concrete buildings in San Francisco stood the test in a remarkable manner. Since these great fires and the splendid practical examples of fire resisting tests of concrete buildings, reinforced concrete structures have been erected throughout the country in great numbers.

More recent fires have occurred in concrete buildings and one example of fire-resisting properties of concrete is a severe and practical test in June, 1909, in a plant in Philadelphia. In the burning of this plant, the concrete was tested from within and without by a fire so hot that the window glass which was of the wire glass type was melted in its metal frames.

About this building and comprising a part of the plant were several frame buildings. The fire originated in one of these and when the fire was at its height, the concrete building, at a certain point, was practically enveloped in flames. The contents of the building made an intensely hot fire.

As mentioned above, the heat was so intense that it caused the wire glass to melt. This, no doubt, was due to the fact that the windows were open at the time, thus permitting the flames to enter the interior and completely envelope the glass. The buildings immediately adjoining the concrete building were, with one exception, totally destroyed.

The brick boiler house (quite unusual to get afire) adjoining the concrete building was so badly damaged that the owners decided to have it razed to the ground.

The building that escaped destruction owes its survival to the concrete building

which acted as a complete barrier. When the fire was extinguished it was found that the concrete building was standing practically uninjured.

It seems that the end of the building was open and through this the flames concentrated upon a concrete column. In some places the outer surface had cracked. But these damages were all repaired at a slight cost by patching with a strong cement mortar. The vital parts of the structure remained intact.

The owners at once ordered new buildings to be erected in reinforced concrete.

The structure being attacked from within and without and the defects made good at such slight expense was a most unusual case.

Fifteenth. Flexibility in making additions to plant and more satisfactory than mill construction by opening up large openings between the existing buildings and new addition. The very form of reinforced concrete construction and method of erection makes it adaptable to extensions of plant.

The most common design for factory buildings is narrow pilasters between wide windows and curtain walls, or vertical panels between the pilasters.

The method of erection is to build first, the pilasters, floor slabs and roof, then follow with the curtain walls over the windows. In other words, the concrete frame is constructed the same as the so-called steel frame, and then follows the finishing features of the structure, such as the setting of additional forms and molding the curtain walls, cornice, etc.

These are only 8 inches thick and start at the floor slab and finish on top as a window sill at the common height. Thus if the window is 16 feet wide all that is necessary is to remove a slab of concrete 8 inches thick, 3 feet wide and 16 feet long. As this also forms the window lintel, after its removal all that remains standing is the narrow pilasters, therefore demonstrating how much more satisfactory to make additions to mill buildings than the standard mill construction.

Only about 6 1/2 per cent. of the linen manufacture of the United Kingdom is done in England and Wales.

THE MAKING OF MERINO YARNS

BY J. BROWN

With the demand for a lower priced imitation of goods made from pure wool, both in the clothing, knitting and other allied trades, there has in recent years sprung up a large trade in yarns known under the varied names of "merino," "melange," "alaska," etc. Not only is a great amount of business being done, but vast improvements have been made in the machinery used in this particu-

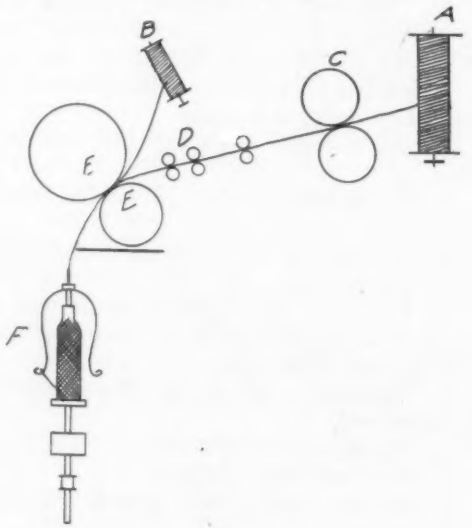


FIG. 1.

lar branch of business. Although the nomenclature is rather elastic in the Yorkshire district, yarns made from cotton and wool mixed before carding are generally known as "merinos," those mixed in the first box before drawing as "Alaskas," those mixed on spinning frames as "core" yarn, and those mixed in twisting as "melange" yarn.

For the larger proportion of merino, the cotton and wool are blended before carding, the yarn being spun on woolen mules, without drafting rollers direct from condenser thread. In this way the difference in the length of cotton and wool causes no serious trouble, as there is no ratch to consider, and the spindle draft will treat all fibers, long or short, with equal facility. This applies to yarns for shirting, costume cloth and men's wear. In making another variety, known as

"coxe" merino yarn, the wool is combed and goes through the drawing operations in the ordinary way. The cotton is mixed on the spinning frame. The thread itself consists of a small proportion of wool encasing a cotton core or inner thread and is largely used in the Nottingham and Leicester trades. If the presents an appearance nearly similar to cloth made from all wool yarn, and in knit goods produces a soft handling surface. If, however, a core yarn is slightly stretched, and the fingers rubbed smartly over it, it is easy to detect the cotton cone.

For hosiery the cotton and wool should be

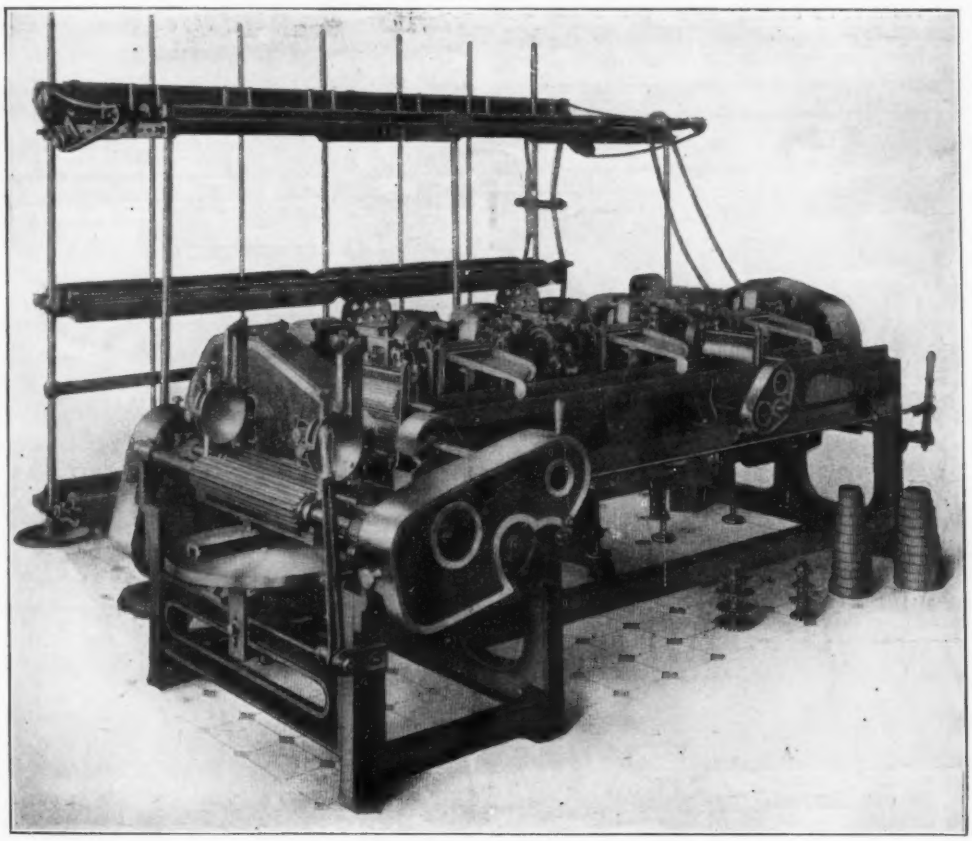


FIG. 2.

cotton passed through the back rollers along with the wool roving, it is obvious that it would be broken during the process of drafting. An extra pin rail for holding the cop or bobbin is, therefore, fixed between the front and back rollers, shown at Fig. 1, and passed through the front roller direct to the spindle. The twisting effect results in the cotton being perfectly encased with the wool. This yarn when woven gives a cloth that mixed before drawing, and for this purpose there is an increasing demand for the O. P. S. gill box. A description of the working parts of this gill box appeared in the February, 1910, issue of the Textile World Record. Fig. 2 shows a three head gill feeding on to one ball, but in the hosiery and other trades using merino yarns, four head gills are generally used, thus giving the spinner the opportunity of using either equal parts or three

to one of cotton and wool. All the heads are driven separately, thus allowing for a variation of draft on one or more heads without interfering with the others. In cases where equal parts of cotton and wool are required, the two end gills take the wool, while the two center gills handle the cotton. Thus in passing along the trough after leaving the front rollers, to balling head, the upper and lower layers of wool entirely cover the cotton slivers, and the combined sliver is then passed to the first drawing box. As there is no twist put in at this process the stock passes flat into the drawing and the cotton is evenly distributed through whole length of sliver. In passing through the subsequent processes there is no danger of twitting and unevenness. The spinner is thus enabled to make merino on ordinary "throstle" frames. It will be noted that in the mixing box, Fig. 3, the balling head is fixed at the end, instead of the front of gill, as shown in the February, 1910, article.

The following specifications, which will probably be of great service to those who are either contemplating or who are already engaged in making merino yarns, is for a four head O. P. S. mixing gill box to wind onto one ball.

	Diameter	Breadth	Flutes	How Fluted
Low front roller	20 M/M	9 inches	7	Spiral tooth
Top " "	20 M/M	9 "	7	and pinion
2 low back roller	2½ M	9 "	15	Tooth and pinion
2 top " "	3 M	9 "	18	" " "
Balling rollers	4 M	22⅞ "		

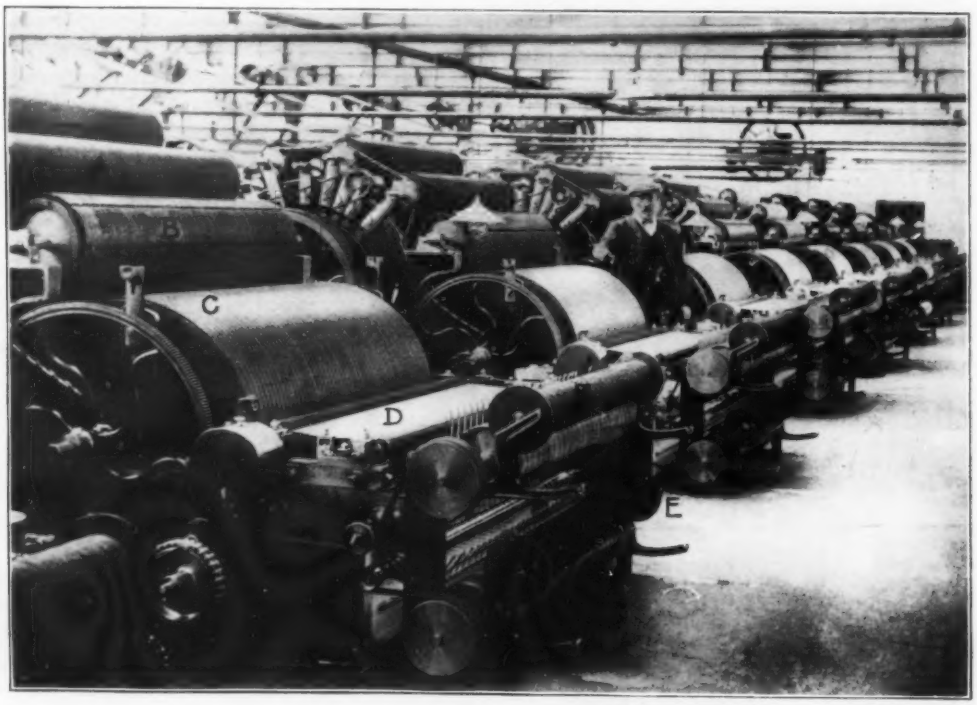


FIG. 3.

The front rollers are weighted by long lever and 11-pound weights. The back rollers are weighted by a dead weight and spring. There are special stationary funnels. The saddle boxes are bored out of solid 4 set of screws 45/64 inch pitch, last thread 7/16 inch pitch, 15 fallers up and 5 down. The fallers are 9/32 inch thick, 19/32 inch deep, and 13 1/2 inches long length, with the ends grooved. They are steel, pinned through 2 rows of pins, 18 per inch, set over 8 1/4 inches; full length of pins, 1 5/16 inches front, 1 7/8 inches back row.

Front rollers wheels, 48.
Back rollers wheels, 100.
Double stud, 90/35.
Back shaft, 72.
Driving and change wheel, 40.
All ⅜ inch pitch, 1 inch bore and 1¼ inches wide.

The ordinary balling head is driven at the left hand facing the delivery. There is an extra set of smooth rollers between 3d and 4th head to draw in the slivers. The end delivery rollers by balling head are 3 inches in diameter, 18 flutes. Middle set of carrying rollers are 3 inches in diameter, with plush covered rubbers. There is a slopper rod both at front and back. There is a sheet iron tray between end delivery rollers and balling roller, also a creel behind for 24 slivers with 3 pairs fluted wood rollers.

Platt Bros. & Co. build a merino machine for mixing cotton and wool to precede the first operation of drawing on the French system of preparing machines. The machine has four heads or deliverers, the first and fourth being for wool and the second and third for cotton. The driving and gearing in the wool boxes are quite independent of those in the cotton boxes, so that the draft for either the wool or the cotton can be varied as desired. This machine is also made with 5 heads when required so that the percentage of wool and cotton can be varied to suit requirements. The machine is being largely used where merinos are made on the French system of drawing and spinning, but as the process is really an intermediate one, either it or the O. P. S. box can be used for either system of drawing and spinning. In both machines the cotton and wool are drafted independently and are evenly distributed through the whole length of the sliver. It would be useless to mix the cotton with combed wool at any previous process. Although the blend might be passable in the carding, as soon as the stock arrived at the comb, the main part of the cotton would find its way into the noil bag.

In making merino yarns on carded woolen machinery, the processes are fewer and simpler than with worsted, as there is neither ratch, draft nor twist until the actual spinning of the thread takes place. The worsted spinner tries to lay his fibers side by side, and the longer the fiber the better the results. The woolen spinner crosses his fibers as much as possible, and boasts that if a fiber is long enough to have two ends to it, he can make a thread from it.

In the carded woolen process the cotton and wool are mixed either in the "Willey" or "leaser," and it comes to the scribbler thoroughly blended. Instead of a simple two cylinder card, with auxiliary lickers-in, strippers and workers, as in worsted carding, a woolen carding plant consists of breaker, intermediate and condenser card. The work of the breaker is to separate all the fibers, while the intermediate, by means of the "Scotch" or "Blamires" feed lays the fibers crossways on the feed sheet of carder, ready for the final process before condensing.

The following is an average list of the counts and crown, points per square inch, and counts of wire of scribbler, for fine stock .72 inches on wire:

Name of Roller	No. of Rollers	Count and Crown	Points per Square Inch	Size of Wire (B.W.G.)
Feed Rollers	3	—	—	14s
Taker in	1	—	—	16s
Angle Stripper	1	70-6	168	26s
Breast	1	80-8	256	27s
Workers	3	85-8	272	28s
Strippers	3	70-6	168	26s
Fancy	1	60-6	144	28s
Breast Doffer	1	85-8	272	28s
Angle Stripper	1	80-8	256	29s
1st Swift	1	120-10	480	32s
Workers	4	125-10	500	32s
Strippers	4	100-9	360	30s
Fancy	1	65-7	182	32s
Doffer	1	125-10	500	32s
Angle Stripper	1	100-9	360	31s
2nd Swift	1	130-10	520	34s
Workers	4	135-11	594	35s
Strippers	4	110-9	396	32s
Fancy	1	70-7	196	33s
Doffer	1	130-12	624	35s

The counts are the number of points in five inches, measuring round a roller, while the crown is the number of two-pointed staples in one inch across the roller.

CLOTHING FOR SINGLE IMTERMEDIATE 72 in. ON WIRE..

Name of Rollers	No. of Rollers	Count and Crown	Points per Square Inch	Size of Wire
Feed Rollers	3	—	—	16s
Taker in	1	—	—	18s
Angle Stripper	1	100-9	360	31s
Swift	1	130-11	572	35s
Workers	4	135-11	594	35s

Strippers	4	110-9	396	32s
Fancy	1	75-7	210	34s
Doffer	1	135-12	648	35s

The stock as it comes from the intermediate is in the form of a twistless sliver about 5 inches broad, 3/4 to 1 inch thick, and is carried without tension to avoid risk of breaking. The finisher is clothed finer than the breaker or intermediate.

Name of Rollers	No. of Rollers	Count and Crown	Points per Square Inch	Size of Wire
Feed Rollers	3	—	—	16s
Taker in	1	—	—	18s
Tumbler	1	100-10	400	31s
Tumbler Worker	1	110-9	396	32s
Breast	1	130-10	520	34s
Workers	2	130-11	572	34s
Strippers	2	110-9	396	32s
Angle Strippers	1	110-9	396	32s
1st Swift	1	130-11	572	35s
Workers	4	135-11	594	35s
Strippers	4	120-9	432	33s
Fancy	1	80-8	256	34s
Doffer	1	135-11	594	35s
Angle Stripper	1	120-9	432	33s
2nd Swift	1	140-12	672	36s
Workers	4	145-12	696	36s
Strippers	4	120-12	576	34s
Fancy	1	80-8	256	35s
*Doffer	1	140-12	672	36s

Fig. 3 shows a row of finisher cards, the doffers being closed with rings which deliver the roping to the condensers, where it is rubbed and wound on spools in the ordinary way.

—÷—

The number of cotton spindles in the world is estimated at 135,000,000, which is an increase of at least 20,000,000 spindles since 1907. During the past ten years there has been an increase of 10,400,000 spindles in the United Kingdom, 7,500,000 spindles in continental Europe, and 1,155,000 spindles in India. The increase in the United States is estimated at about the same number as in the United Kingdom.

There are 935,000 flax spindles and 36,000 power looms on linen in Ireland. England has only 50,000 spindles, and Scotland 160,000. The output of linen piece goods from the British Isles in 1907 was 220,722,000 yards, valued at $30,000,000, while the output of highly finished linen fabrics was several million dollars more.

WORSTED AND SERGE CLOTH

Editor Textile World Record:

To settle a dispute I would like to have you explain the difference between a worsted cloth and a serge cloth. Halifax (1892).

A serge may be made of silk or worsted, or worsted and silk, or carded woolen and worsted. It is woven with a twill weave and finished with a smooth face. A dispute as to the difference between a worsted cloth and a serge cloth is, therefore, a waste of time, as the difference depends altogether upon what kind of a serge and what kind of a worsted cloth one has in mind. In this connection the following account of the serge fabric taken from Cole's Encyclopedia of Dry Goods may be of interest:

Serge. (Formerly also sarge. Supposed by some authorities to have been derived from Italian sargina, cloth of wool mixed with silk; Latin serica, silken garments. Other writers find the root for the word in Spanish zerga, a blanket, coarse frieze.) A generic title under which is classed a large number of fabrics of twill construction, woven either of worsted, silk, or of cotton yarn, and variously dyed, finished and ornamented; as, silk serge, serge suiting, storm serge, mohair serge, Whitney serge, serge de Berry, etc. Worsted serges of various kinds and degrees of fineness have been known and used in Europe since the 12th century. The twill of each English serge was flat and the texture curiously fine. Silk and worsted serges, embroidered and otherwise decorated, were originally employed for curtains and hangings, and other domestic purposes, this use of these fabrics being common throughout Europe as late as the 17th century. Worsted serge appears to have come into general use as a material for men's wear in the 16th century.

Modern serges vary but little from those made two centuries ago. In weight and texture worsted serge resembles flannel, except that it is twill-woven and composed of finer yarns, and usually finished with a smoother surface. Serge suiting, employed for men's clothing, is a variety of light wiry worsted woven with a flat twill, and dyed black or in shades of navy blue; in width 54 inches. Mohair serge is woven with a cotton warp and a mohair weft; in width 32 inches. It is dyed in a great variety of colors and largely used as a lining material for women's cloaks, men's coats and overcoats, etc. Storm serge, so called from its adaptability to withstand exposure to stormy weather, is a coarse variety of worsted dress goods, produced in a wide range of colors and qualities. Iridescent serge is a variety of worsted dress goods woven with a warp and weft of different colors, resulting in the production of a shimmering or iridescent effect. Cravenette serge is a fine-twilled variety having a very firm and closely woven texture, dyed black and in colors.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

A HAND BOOK OF WEAVES

By G. H. OELSER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

The drawing of the warp yarn into the harness is of special importance, as the production of the weave pattern depends upon this process, which is called "drawing-in."

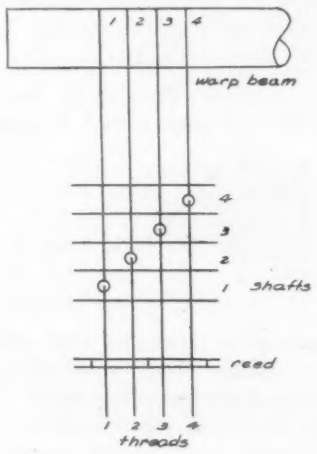


FIG. 1

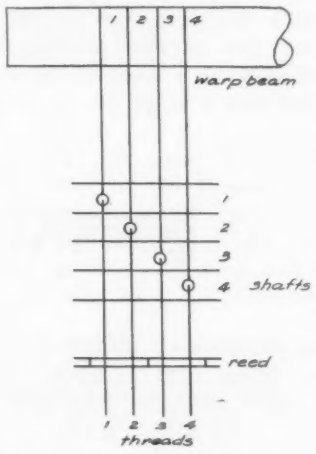


FIG. 2.

In laying out the draft for a pattern, a knowledge as to what effect any particular drawing-in draft would have is essential.

The order of drawing-in is so varied that it is very difficult to give general directions. The number of threads in the weave pattern cannot be taken as a standard for determining the number of shafts to be used, as other conditions must be taken into consideration. When the number of shafts to be used is unavoidably large the drawing-in draft must be arranged to keep the number as small as possible. On the other hand, when the set of the warp is very close it is often necessary to increase the number of shafts to avoid too many heddles on one shaft, a condition that causes difficulty in forming a clear shed.

It is often necessary to arrange the drawing-in draft for fancy goods, not only to make the work of drawing-in regular and convenient, but also to bring certain shafts in particular positions to conform to the strength of the yarn, or to facilitate the formation of the shed. If the warp is composed of both cotton and wool yarn, the shafts carrying the wool warp should be placed nearest the reed. Likewise warp threads making abrupt and difficult intersections should be on shafts as near the reed as possible.

Verbal instructions for drawing-in are sufficient only for straight drafts. To avoid errors a drawing-in draft should always be supplied to the operative. The shafts are represented in the draft either by horizontal lines or by spaces between the lines. In this work the spaces between the lines are used for this purpose. The numbering of the shafts on the draft must correspond with the shafts on the loom, and be understood by all the operatives who have occasion to refer to the drafts.

There are two methods of drawing-in:

1. From the reed toward the whip roll (from bottom to top, Fig. 1).

2. From the whip roll toward the reed (from top to bottom, Fig. 2).

The first thread is at the left in each case. Neither of these methods has any advantage over the other, and the use of both in different mills is frequently a cause of confusion.

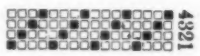


FIG. 3.

FIG. 4.

On the one hand it is claimed the rear shaft should be called the first one since the yarn as it comes from the warp beam comes in contact with that shaft first. On the other hand it is said that the front shaft should be called the first as it is next the weaver or drawer-in and that it is the first to meet the operative's eye.

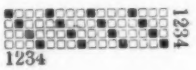


FIG. 5.

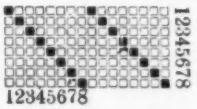


FIG. 6.

These two methods are designated by the expressions "from front to back" for the first, and "from back to front" for the second.

The warp threads in Figs. 1 and 2 are indicated by the perpendicular lines, the first thread being that at the extreme left. The shaft on which the thread is drawn is indicated by a point, circle, cross or figure. Ordinarily the drawing-in draft is marked on drafting paper, along with the weave draft, Figs. 3 and 4. Fig. 3 is a straight draft on four harness from front to back. Fig. 4 is a straight draft on four harness from back to front.

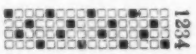


FIG. 7.

The various drawing-in drafts may be classified as follows:

1. Straight.
2. Scattered or Satin.
3. Pointed.
4. Broken.
5. Intermittent.
6. Manifold or Corkscrew.
7. Grouped.
8. Divided.
9. Combination.

These are sometimes classified as straight (1) and cross drafts (2 to 9).

1.—Straight

The straight drawing-in draft forms a basis for all others and proceeds in one direction only. It can be used with any number of shafts. Each succeeding thread is drawn on the succeeding shaft. If the first thread comes on the first shaft, the second thread must come on the second shaft, the third on the third shaft, etc. With eight shaftss the threads will be drawn in as follows:

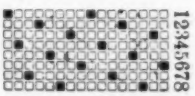


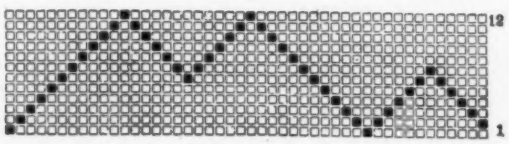
FIG. 8.

On shaft 1.....threads 1, 9, 17, 25, etc.
On shaft 2.....threads 2, 10, 18, 26, etc.
On shaft 3.....threads 3, 11, 19, 27, etc.
On shaft 4.....threads 4, 12, 20, 28, etc.
On shaft 5.....threads 5, 13, 21, 29, etc.
On shaft 6.....threads 6, 14, 22, 30, etc.
On shaft 7.....threads 7, 15, 23, 31, etc.
On shaft 8.....threads 8, 16, 24, 32, etc.

The number of threads in a straight draft is equal to the number of shafts, and each shaft carries one thread for every repeat of

the draft. Fig. 5 is a straight draft from back to front on four shafts. Fig. 6 is a straight draft from back to front on eight shafts.

FIG. 10.



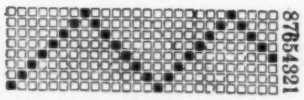


FIG. 9.

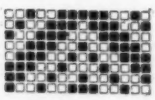


FIG. 11.

2.—Scattered or Satin

In this draft the order of drawing-in is disconnected and scattered so that it resembles the draft for a satin weave, from which it has derived the name, satin. At least four shafts are required for this style of drawing-in. Fig. 7 is a satin draft on four shafts; Fig. 8, a satin draft on eight shafts.

3.—Pointed

This order of drawing-in consists of running a straight draft first in one direction

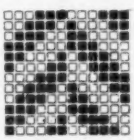


FIG. 15.

and then in the other. The shaft at each point of reversal receives but one thread, the other shafts each carrying two theads, for the resulting double line. The number of threads in a pointed drawing-in draft in which the line runs the same distance in each direction, is two less than double the number of shafts. For example, the pointed draft on eight shafts, Fig. 9, includes 14 threads. The thread at either point of reversal is called the "point thread."

By varying the length of the lines in either direction two or more points can be brought into one draft. It is not necessary that the lines cover the same number of threads in each direction. By changing the direction at irregular intervals the point threads can be brought on different shafts, and, in fact, arranged so that each shaft carries the same number of threads, as in the case of a straight draft.

Peculiar effects can be obtained by varying the order of reversing a pointed draft, as shown in the draft on 12 shafts at Fig. 10. By using a twill weave with a pointed drawing-in draft the effect in the cloth is similar to that of the drawing-in draft. This causes the threads to float over several extra threads at the point of reversal, Fig. 11,

FIG. 12.

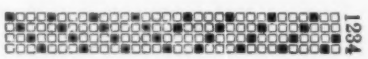
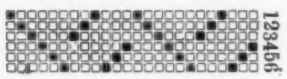


FIG. 13.



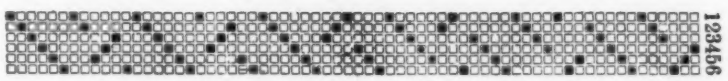


FIG. 14.

The first thread is at the left in each case. Neither of these methods has any advantage over the other, and the use of both in different mills is frequently a cause of confusion.

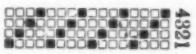


FIG. 3.

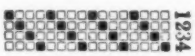


FIG. 4.

On the one hand it is claimed the rear shaft should be called the first one since the yarn as it comes from the warp beam comes in contact with that shaft first. On the other hand it is said that the front shaft should be called the first as it is next the weaver or drawer-in and that it is the first to meet the operative's eye.

FIG. 5.

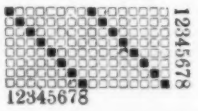


FIG. 6.

These two methods are designated by the expressions "from front to back" for the first, and "from back to front" for the second.

The warp threads in Figs. 1 and 2 are indicated by the perpendicular lines, the first thread being that at the extreme left. The shaft on which the thread is drawn is indicated by a point, circle, cross or figure. Ordinarily the drawing-in draft is marked on drafting paper, along with the weave draft, Figs. 3 and 4. Fig. 3 is a straight draft on four harness from front to back. Fig. 4 is a straight draft on four harness from back to front.

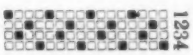


FIG. 7.

The various drawing-in drafts may be classified as follows:

1. Straight.
2. Scattered or Satin.
3. Pointed.
4. Broken.
5. Intermittent.
6. Manifold or Corkscrew.
7. Grouped.
8. Divided.
9. Combination.

These are sometimes classified as straight (1) and cross drafts (2 to 9).

1.—Straight

The straight drawing-in draft forms a basis for all others and proceeds in one direction only. It can be used with any number of shafts. Each succeeding thread is drawn on the succeeding shaft. If the first thread comes on the first shaft, the second thread must come on the second shaft, the third on the third shaft, etc. With eight shaftss the threads will be drawn in as follows:

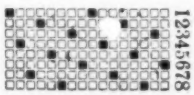


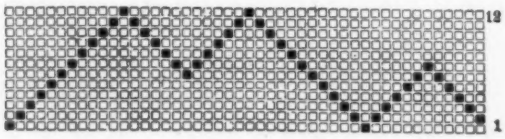
FIG. 8.

On shaft 1.....threads 1, 9, 17, 25, etc.
On shaft 2.....threads 2, 10, 18, 26, etc.
On shaft 3.....threads 3, 11, 19, 27, etc.
On shaft 4.....threads 4, 12, 20, 28, etc.
On shaft 5.....threads 5, 13, 21, 29, etc.
On shaft 6.....threads 6, 14, 22, 30, etc.
On shaft 7.....threads 7, 15, 23, 31, etc.
On shaft 8.....threads 8, 16, 24, 32, etc.

The number of threads in a straight draft is equal to the number of shafts, and each shaft carries one thread for every repeat of

the draft. Fig. 5 is a straight draft from back to front on four shafts. Fig. 6 is a straight draft from back to front on eight shafts.

FIG. 10.



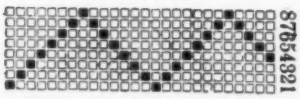


FIG. 9.

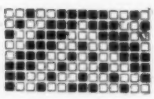


FIG. 11.

2.—Scattered or Satin

In this draft the order of drawing-in is disconnected and scattered so that it resembles the draft for a satin weave, from which it has derived the name, satin. At least four shafts are required for this style of drawing-in. Fig. 7 is a satin draft on four shafts; Fig. 8, a satin draft on eight shafts.

3.—Pointed

This order of drawing-in consists of running a straight draft first in one direction

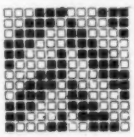


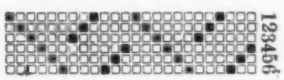
FIG. 15.

and then in the other. The shaft at each point of reversal receives but one thread, the other shafts each carrying two theads, for the resulting double line. The number of threads in a pointed drawing-in draft in which the line runs the same distance in each direction, is two less than double the number of shafts. For example, the pointed draft on eight shafts, Fig. 9, includes 14 threads. The thread at either point of reversal is called the "point thread."

By varying the length of the lines in either direction two or more points can be brought into one draft. It is not necessary that the lines cover the same number of threads in each direction. By changing the direction at irregular intervals the point threads can be brought on different shafts, and, in fact, arranged so that each shaft carries the same number of threads, as in the case of a straight draft.

FIG. 12.

FIG. 13.



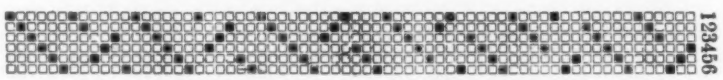


FIG. 14.

Peculiar effects can be obtained by varying the order of reversing a pointed draft, as shown in the draft on 12 shafts at Fig. 10. By using a twill weave with a pointed drawing-in draft the effect in the cloth is similar to that of the drawing-in draft. This causes the threads to float over several extra threads at the point of reversal, Fig. 11,

which is objectionable in some classes of goods.

4.—Broken

Here one group of threads is drawn in straight in one direction and then another group is drawn in straight in the opposite direction. Where the direction is reversed the first thread of the new series is started higher or lower than the last thread of the preceding series. In the cloth thus woven the twill runs forward and backward in the order of drawing-in.

Instead of the symmetrical union of the two lines as made by the pointed drawing-in draft, a break occurs in the weave, which makes the point of junction distinct. The new twill line (especially with balanced twills) begins with a sharp break against the old line, Fig. 15. Where the twill reverses the last thread of one twill line works in opposition to the first thread of the succeeding twill line. The risers of one thread come opposite the sinkers of the other thread. The twill can, of course, be run in either direction as far as desired. Figs. 12, 13 and 14 show three variations of broken drafts.

In most cases the broken draft is preferable to the pointed, and is much more frequently used. The former gives a better interlacing of the threads and a better junction of the twill lines than is possible with a pointed draft.

FIG. 16

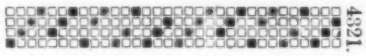
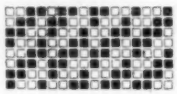


FIG. 18.



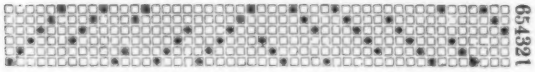


FIG. 17.

5.—Intermittent

This is a straight draft with this difference, that at short intervals a certain number of shafts are skipped, the number depending on the weave to be used. Fig. 16 shows an intermittent draft on four shafts, in which the draft is broken every four threads. This style of drawing-in enlarges the pattern to a greater or less extent, as compared with a straight draft. The direction of the intermittent draft can be changed, as illustrated at Fig. 17, which shows a draft on six shafts, reversed at the end of every twenty-four threads.

The number of shafts skipped to produce a break in an intermittent draft depends on the character of the weave. Thus 1 shaft is skipped on a $^{2}\!-\!_{2}$ twill; two shafts on a $^{3}\!-\!_{3}$ twill; and 3 shafts on a $^{4}\!-\!_{4}$ twill, to obtain the desired break. Fig. 18 is the weave pattern obtained with a $^{2}\!-\!_{2}$ twill and the drawing-in draft at Fig. 16. The first and last threads in an intermittent draft should break with each other.

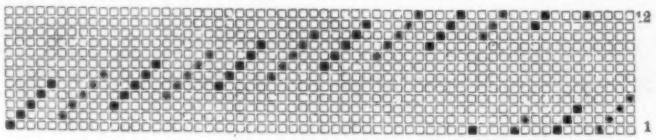


FIG. 19.

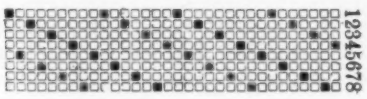
Peculiar effects are obtained by carrying each goup of threads forward in progressive order, as shown at Fig. 19, in which the drawing-in of each group is begun 1 shaft in advance of the preceding group.

6.—Manifold or Corkscrew

This draft is used where each twill line is formed by alternate threads, leaving the next

twill line to be formed by the intervening threads, Fig. 23. It is especially effective where the warp is dressed 1 light, 1 dark, each color forming a separate twill. An even number of shafts are divided into two

FIG. 20.



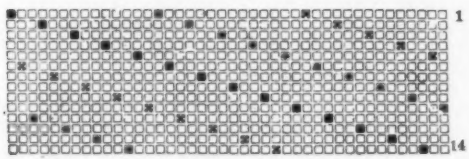
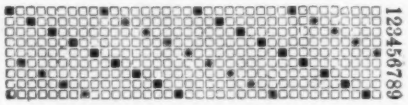


FIG. 22.

equal groups, one including the odd, the other the even numbered shafts. With eight shafts each group consists of four shafts. The odd numbered threads in the warp are

twills (threads 2, 4, 6, 8, etc.) is begun on the shaft following the larger division of the whole number of shafts. For example, when nine shafts are divided into two parts, 1 to 5 and 6 to 9, the first twill begins

FIG 21.



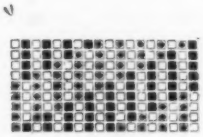


FIG. 23.

on shaft 1, the second twill on shaft 6, Fig. 21. Fig. 23 is the corkscrew weave obtained with a 9-leaf $^{5}\!-\!_{4}$ twill and the drawing-in draft shown at Fig. 21.

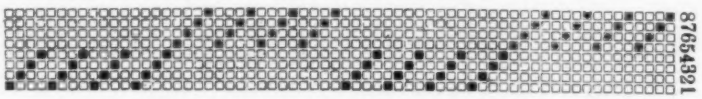


FIG. 24.

drawn in straight on alternate shafts beginning with shaft 1. The even numbered threads are drawn straight on alternate shafts beginning with shaft 5, Fig. 20, in which the two sets of shafts are distinguished by two different marks.

To combine three twills the shafts are divided into three parts; thus, 12 shafts into 3 divisions of 4 each. The drawing-in is begun with the first thread on the first shaft of the first group, the second thread on the first shaft of the second group, the third thread

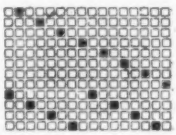


FIG. 25.

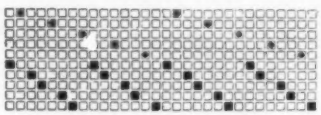


FIG. 56.

A better junction of the two twill lines is obtained with an uneven number of shafts, 7, 9, 11, etc., because of the overlapping of the floats of adjacent warp threads. The drawing-in of the threads for one of the

on the first shaft of the third group, as 1, 5, 9, 2, 6, 10, 3, 7, 11, etc. Here also a better effect is obtained by using a number of shafts that cannot be divided into three equal groups, using the largest group for the first

twill. Fig. 22 is an example of such a draft on 14 shafts, beginning 1, 6, 11, etc. If the warp is dressed 1 black, 1 grey, 1 white, 3 twills of different colors will be formed in the cloth, the first black, the second grey, and the third white. The three twills are distinguished on the draft, Fig. 22, by three different marks.

7.—Grouped

This style of drawing-in is often used for the production of striped, checked and other fancy effects, for which two weaves are used, the threads of one weave coming on one set of shafts, and those for another weave on a separate set. Fig. 24 shows a grouped draft on 8 shafts, 16 threads being drawn straight on each half (4) of the shafts, to form the complete pattern.

8.—Divided

This style of draft is much employed, both for double warp and double warp and filling fabrics. The face and back threads are each drawn on a separate group of shafts. Fig. 25 shows a divided draft for which the warp is dressed 1 face, 1 back. The four front shafts carry the face warp; the other eight shafts, the back warp. If the warp is dressed 2 face, 1 back, with face and back, each carried by five shafts, the draft will be as shown at Fig. 26, the face warp coming on the five front shafts, and the back warp on the five back shafts. The shafts carrying the face threads are usually hung next to the reed, as the weave for the back threads is generally easier than the face weave.

9.—Combination

The various styles of drawing-in are frequently combined for the production of weave patterns. The variety of these patterns is unlimited and it is, therefore, impossible to give a general idea of them from a few examples.

The nine classes of drawing-in drafts described above form the ground work for all drafts. In the succeeding study of weaves it will be shown how these methods of drawing-in should be employed. It must not be understood, however, that every possible fabric can be made with the examples given. Many variations, both in number of the shafts and in the grouping of the threads will be found necessary in practice. Many factors must be taken into consideration in deciding upon the number of shafts and the order of drawing-in for a particular pattern. Among them may be mentioned the following:

1. The drawing-in draft should be as simple as possible in order to facilitate the work of the drawer-in and weaver.

2. The number of shafts should be as small as practicable. Closely set cloths require a larger number of shafts.

3. As uniform a distribution of the threads on the different shafts as possible.

4. The formation of a clear shed.

5. Relieving the strain on the warp yarn. The threads with the least number of intersections in the weave are drawn on the back shafts. The shafts carrying the least number of threads are placed as far back as possible. The best method of drawing-in can be determined only by experience and a study of the various kinds of weaves.

(To be continued.)

(*Copyright 1911 by Samuel S. Dale*)

FRENCH WORSTED SPINNING

BY ROBERT DANTZER

Translated from the French by the Editor or the Textile World Record

(Continued from June.)

Another type of Heilmann comb, which is built by the Societe Alsacienne de Constructions Micaniques, is shown at Fig. 11. The characteristic feature of this comber consists in the method of drafting which enables the rollers to approach very close to the clamps holding the wool. Like all intermittent combers this machine is suited for either the French or Bradford system of worsted spinning and for a wide range of wools. It can comb wool ranging from lambs' wool to wool having a staple 14 inches in length. The production varies with the class of wool from 15 to 30 pounds an hour.

General Remarks. The doubling at the comb varies from 16 to 24. With the French system from 22 to 24 slivers are usually assembled together. The draft is variable be-

cause the delivery varies from 3 to 10 inches. The feed varies from 1/4 to 3/8 inch at each stroke of the comb, according to the length of the wool. The speed of the different combs vary from 95 to 100 strokes per minute. With merino wool the feed will

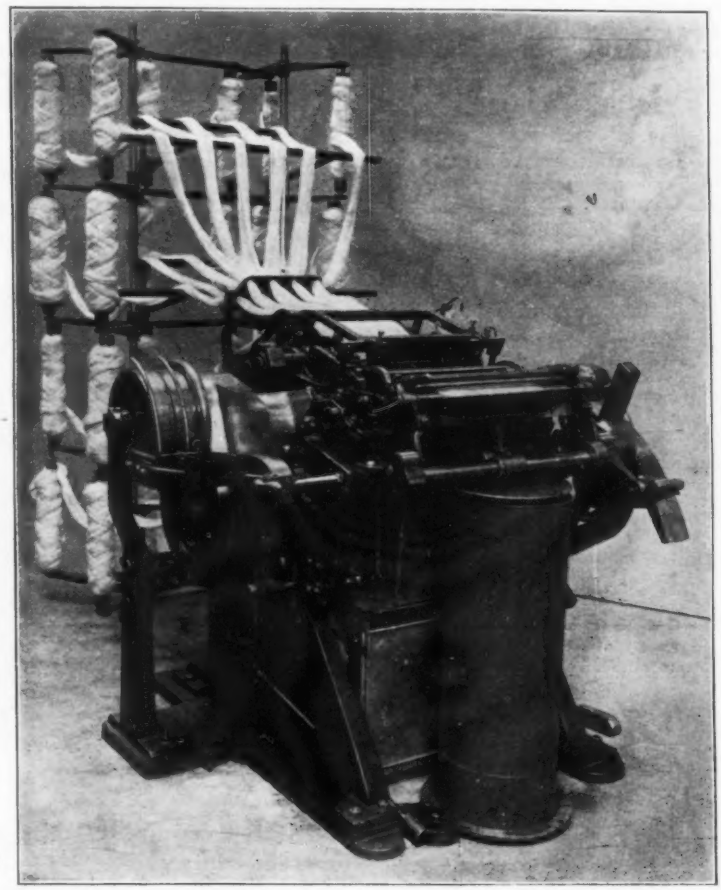


FIG. 11.

average 3/10 inch per stroke. The delivery will average 4 8/10 inches, consequently the average draft is 15.

Production. As has already been stated, the sliver after leaving the second gill box before combing weighs from 104 to 135 grains per yard. With a weight of 120 grains and a doubling of 24 the weight of the comb sliver will be as follows:

$(120 \times 24) \div 15 = 112$ grains. It is necessary, however, to deduct the weight of the noil or short fibers which have been removed during the combing process. The noils vary from 10 to 30 per cent. of the total weight of the sliver delivered to the comb. Assuming that the noils amount to 10 per cent., the weight of a yard of comber sliver in the case cited above as follows:

$112 \times .90 = 101$ grains. The production of the comb is easily calculated. If, for example, the comb is running 95 strokes per minute with 3/10 inch at each stroke, the length drawn out per minute will be as follows: 3/10 (inch) $\times$ 95 = 28 inches. 28 (inches) $\times$ 60 = 46 2/3 yards per hour. Assuming a doubling of 24 and that the sliver

weighs 120 grains to the yard, the weight per hour will be as follows: 120 × 24 × 46 2/3 = 19.2 pounds per hour, or 192 pounds per day of 10 hours. Allowing 10 per cent. for noils this will give a production of 192 × .90 = 173 pounds of tops.

number of comber slivers and subject them to the drawing process. In this way a stronger sliver is obtained, capable of withstanding the succeeding operations. Fig. 12 shows the cross section of this draw-box, which is equipped with a porcupine roll. The

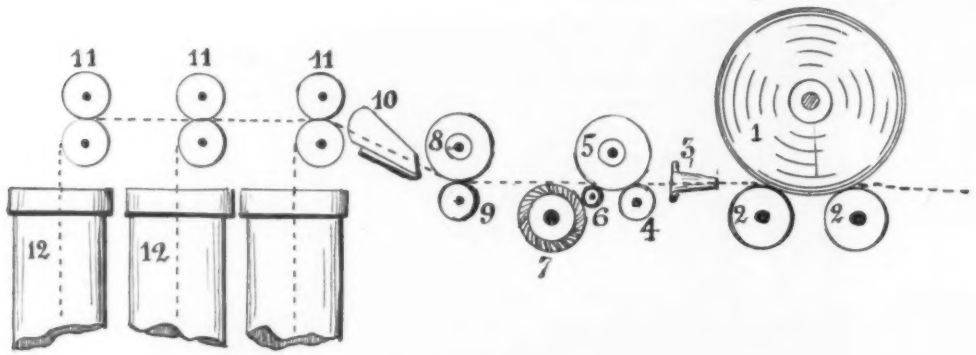


FIG. 12.

Because of the method of formation, one delivery being placed on top of another in order to obtain a splicing, the slivers delivered by the comb are lacking in strength. This makes it very difficult to handle the material on bobbins, consequently on most of the combs now built the sliver is delivered

slivers are drawn from the comber cans, 12, by the rollers, 11, which are made of wood with the surface slightly polished. The upper rolls are driven by friction with the lower, which are driven by power. The slivers are collected in a guide, 10. This draw-box consists of a pair of feed rolls, 8 and 9,

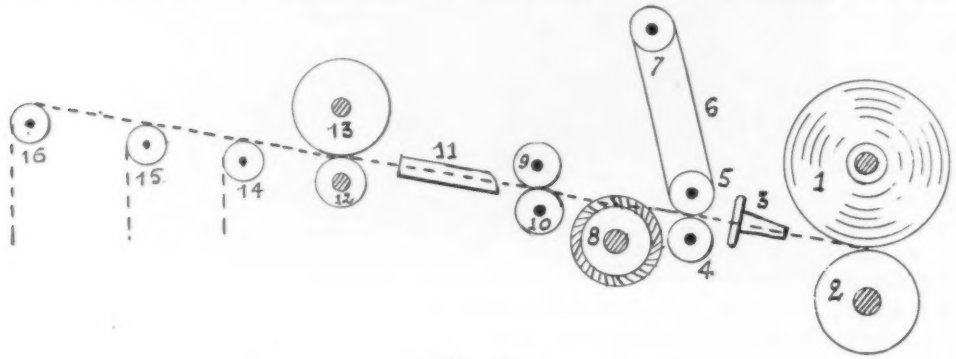


FIG. 13

into a cylindrical can which is revolved during the operation of the machine. The sliver is easily drawn from the can to be delivered to the succeeding machine and with little chance of breakage.

Drawing. The passage through the first draw box has for its object to combine a

a circular comb, 7, and a delivery roller, 4, 5 and 6. The sliver as it comes from the draw-box passes through the tube, 3, and is wound on the bobbin, 1, by friction with the corrugated wood rollers, 2. Fig. 13 is a cross section showing a draw box of a somewhat different form from that shown at Fig.

12. The slivers are drawn from the cans by rollers, 12 and 13. The rollers, 14, 15 and 16, serve only to guide the slivers to the drawing mechanism. The slivers then pass through the guide, 11, between the feed rolls, 9 and 10, over the porcupine rollers, 4 and 5. The upper roller, 5, is provided with a leather apron, 6, which runs vertically over the roller, 7. The tube, 3, guides the sliver from the draw box to the bobbin, 1, which is driven by contact with the corrugated wood roller, 2. In recent years the intersecting gill box has been substituted for the porcupine draw box. Fig. 14 is a gill-box which will be described later.

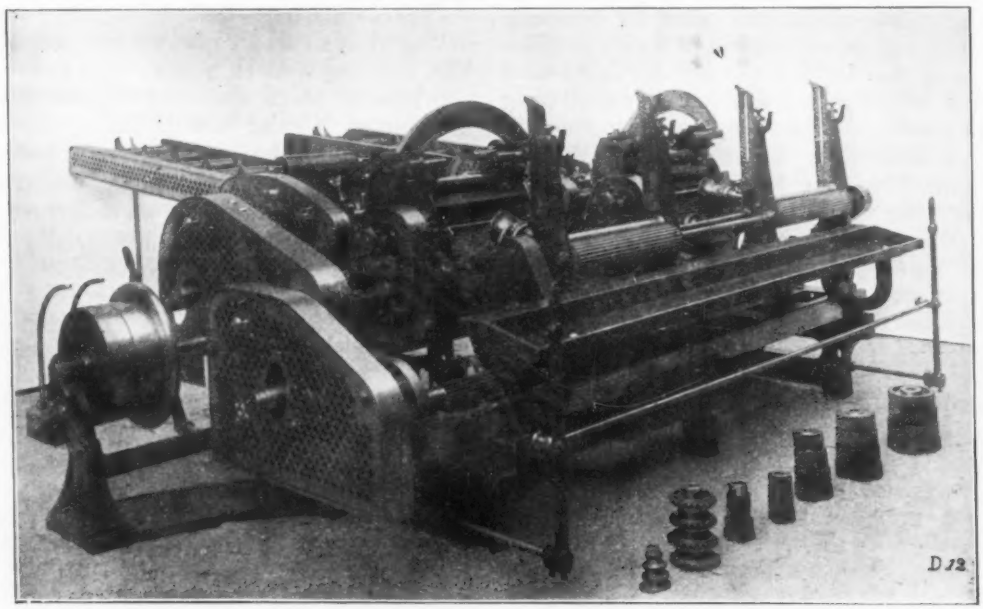


FIG. 14.

The rectilinear comb gives a better production than the porcupine draw box. Owing to the light weight of the sliver comb from the comber, from 7 to 10 strands are delivered to the first draw-box and the draft is adjusted so that the sliver delivered will weigh not more than 220 grains per yard. If, for example, the sliver from the comb weighs 180 grains and 7 of these are delivered to the draw box, the draft required to give a sliver of 220 grains will be calculated as follows: $(13.1 \times 7) \div 16 = 5.7$, draft. The gill box, shown at Fig. 15, is of the ordinary type, that is, with rectinilear fallers and a double screw. These machines do not differ from those used in preceding processes, or from those that are used in succeeding processes except in respect to the set and fineness of the pins. The object of the gill box at this stage of the process is to make the sliver more regular. Usually the draft is equal to the doubling, giving a sliver weighing 220 grains per yard, as obtained from the preceding machine.

The next gill box is called the finisher and for this intersecting type is much in favor. Here again the draft is made equal to the doubling. Sometimes this gill box is dispensed with in which case the sliver from the preceding box is wound on wood spools. The finisher gill box is generally used in custom combing mills, the sliver being delivered on slightly conical shaped tubes in order to reduce the weight and cost of transportation.

(To be continued.)

ENGLISH NOTES

From Our Special Correspondent

The latest outcry from Bradford against undesirable features in wool concerns grey hairs. Grey or black hairs scattered throughout the fleece are becoming common in colonial wool as they long have been in most English varieties. Some disposition has been shown to attribute this to breeding of black sheep, but black sheep are born of white parents and it is at least probable that white lambs might be born of black ones were black sheep commonly used for breeding. There is a certain amount of reason for supposing that black sheep are not much used as stores and a good deal more for attributing the presence of grey hairs to the employment of blackfaced or darkfaced sires. The all-black sheep is a freak of nature, but the black face of certain breeds is a permanent characteristic. And as American consumers of "North" wools can verify from their own experience, the introduction of blackfaced rams has caused a clip which used to be free from grey to be free no longer. So long as Northern English and Scottish farmers bred from Border Leicester sires and Cheviot ewes grey was absent from the fleece as it still is from the produce of some farms. So soon as they put Oxford Down and Hampshire Down rams into service the trouble appeared. The latter are used because they do more good to mutton than they do harm to wool, but that is not a reason why wool users should not declare their objection to wool which will not take light dyes.

* * *

Samples have been already sent of the marine vegetable fiber that is fished from Spencer Gulf, Australia, and that has been tried as a substitute for wool. Yorkshire experiments with it have disclosed at least one striking feature. The fiber is a vegetable, but it refuses cotton dyes and has to be treated with the same dyes as wool. Carded woolen fabrics of 50 per cent. crossbred wool and 50 per cent. of this seaweed have been woven, and small patterns of the goods are sent. The handle is decidedly more rasping than is usual in goods containing so much wool and examination of the yarn does not give the impression that the weed has strong wearing qualities. Two manufacturers who have tried it regard it rather as a substitute for jute than for wool or shoddy and they agree that perhaps the best hope for the substance is employment in making cheap rugs. The patterns sent are at least a novelty.

* * *

Woolen manufacturers must not be surprised by the advent of still another substitute for wool. The article is not on the market yet and exact information about it is not procurable, but it looks enough like wool to deceive at a cursory glance a man who has been handling wool all his life. It is a wood-pulp product which, according to preliminary whisperings, is going to make the sheep-man tremble and revolutionize all contemporary notions. Experiments in dyeing and spinning this wood wool are going on and more will certainly be heard of it in the near future. The position of wool has been assailed too long and too often to allow practical men to be anything but sceptical of the advantages of an artificial wool made from the same materials and substantially in the same manner as artificial silk, but the product promises to be interesting.

* * *

From the reports of medical officers in 46 Lancashire districts a list has been drawn up of diseases especially prevalent among cotton weavers. It includes tonsilitis, pharyngitis, phthisis, gastric ulcer, anaemia, dyspepsia, rheumatism, decayed teeth and chronic nasal catarrh. The foregoing are the diseases which do exist and the following are the diseases liable to be spread by the dirty habit of shuttle kissing or by loose dirt and dust: Phthisis, syphilis, diphtheria, septic throat, quinsy, skin diseases, follicular tonsilitis, decay of teeth, bronchitis, scarlet fever, pharyngitis and possibly smallpox, cancer and lupus. The possibilities have been duly noted on Government behalf.

A mysterious ailment not in these schedules has created consternation at Colne. Weavers, overlookers and clothlookers were alike attacked by unpleasant symptoms which comprised a specially irritating cough along with yellowish or greenish expectora-

tion. Many had to go home and all were seriously frightened until the mischief was definitely brought home to the sizing. The whole atmosphere of the shed was found to be charged with spores of mildew shaken loose from the warps in use at the time.

The measures taken to reduce dust in cotton card rooms proceed gradually. Fifty-six out of 322 mills reported on have installed apparatus to remove all dust in stripping cards and thirteen mills have made less complete arrangements. The joint committee which has been inspecting dust-removal appliances has approved the Gregson, Lang Bridge, Hall & Kay, Smethurst, Hargreaves, Imperia, Atlas & Eureka types of machine and has yet to report on others.

* * *

Some modifications are coming in the English rules on humidifying and ventilating cotton weaving sheds. In its final form, a Government recommendation is that a limit be fixed at which all admission of artificial humidity shall cease. Both in humidified and dry sheds a dry bulb temperature not less than 50° F. is to be maintained after the first half hour of the morning. The new standard of ventilation will allow in humidified sheds during daylight an excess of 8 volumes of carbon dioxide in 10,000; in dry sheds there may be 11 in 10,000 more carbonic acid gas than in the outer air. Thermometer readings are to be taken three times a day jointly by representatives of the employers and the workpeople and entered in a register. Two hygrometers are to be supplied in a shed of 700 looms and one instrument extra for every additional 500 machines. New sheds built for humidification are to have the bottom sawtooth gutter at least 12 feet from the ground and the average head-room is to be not less than 14 feet, 6 inches. The windows in the roof are to point true north and be set at not more than 30° to the vertical. The boilers and engine are to be separated from the weaving shed by an alley of 6 feet or wider and the glass and every part of the roof is to be whitewashed. The standard of purity of water to be used in humidifying the atmosphere is to be the same as that already applying to flax. Any water which absorbs from an acid solution of permanganate of potash more than .5 grain of oxygen per gallon in four hours at 60° F. is deemed liable to cause injury to health.

* * *

Fifty degrees Fahrenheit has been put by the factory inspection authorities and by a magisterial decision as the desirable temperature for wool sorting work. One wool comber at Bradford has been fined for keeping sorters at work in a temperature of 38° on a day when the outer air was 5° colder. Sorting rooms attached to mills are often warmed and maintained at about 60°. The large wool warehouses intended for storage and incidental sorting have been built without provision for heating and the new demand that they shall be heated is causing Bradford wool merchants to talk ruefully about the loss of weight that will follow on the expulsion of more moisture from stored wool.

* * *

Tops in this country do a good deal of traveling in course of their manufacturing career. They are nearly always combed in one place and spun in another a mile or two away and they have their incidental journeyings—to the slubbing dyer and back, to the recomber and back, to the conditioning-house and perhaps into some warehouse in between. They are generally balled for the purpose. The ball is wrapped in tissue-paper usually of the lowest quality and tied with a strong flax string not much thicker than sewing thread. The paper balls are then put into bags and taken by cart or motor wagon to their destination. The transit is not conspicuously good for tops; the outer surface of the sliver gets more or less disarranged and sometimes soiled because of the inefficient protection of the tissue-paper. Also there is a vast amount of trouble in getting the return of one's bags from the man who has bought the contents. Many bags are lost totally and never paid for and the loss, the disputes, clerk-hire and bookkeeping in connection with bags amount to more than this really minor matter is worth. In these circumstances Isaac Smith (D. Smith & Sons) has propounded the theory that it

would be better to standardize top-bags and make them non-returnable. It remains to be seen whether either topmakers or spinners are willing to bear this expense and a natural fear has been aroused that non-returnable bags will mean cheap bags, still less desirable for contact with tops than those which are in use now. A relatively large sum of capital is sunk in the existing stock of private and unstandardized bags and any schemes for making any one bag exchangeable for any other have to allow for this consideration.

* * *

The complaint is heard of a commission weaver who has been making first acquaintance with the hard Bradford rule which saddles the commission manufacturer with responsibility for any damage done to goods in his care. The commission man undertook to weave 100 pieces at a price which left him $12.50 for his pains. Three pieces were spoiled by the carelessness of one of his weavers and the result is that he owes the customer $45 for the privilege of having done the work. Reasonably enough, he contends that regulations should be adopted determining where a commission weaver's responsibility begins and ends.

The person in point lost about three and a half times as much as he stood to gain. Commission dyers reckon that they lose in a heavier ratio and that for every piece spoilt by them something like ten pieces have to be dyed for nothing. Naturally the losses have to come out of the prices charged and the debits for damages make all the difference between success and failure. The commission weaver had not foreseen his risks and had been so fortunate hitherto as to work only for firms who have not considered it morally or legally right to deduct anything from the weaver's bill. But commission combers, spinners, weavers, dyers and finishers are all alike expected to assume responsibility for their acts. They have no prior claims for wages in the event of an insolvency such as direct employes have, but commonly they guard the financial risk by asserting a lien on account of moneys owing upon all goods in their hands. The wise commission manufacturer also states clearly on his business stationery whether he holds goods covered against risk of fire and exempts himself from delays due to fire, flood, breakdown, labor difficulties and similar calamities.

* * *

Nowadays it is the competition of British with American cotton goods that is most heard of. Less than eighty years ago the competition of American with Lancashire cottons in neutral markets was the cause of complaint. In 1833 an American manufacturer employing 400 hands gave evidence before the British Factory Commission that the American cost of warp dressing and weaving was 21 cents against the English 28 1/2 cents per piece. In dressing heavy warps the American had a 50 per cent. advantage and one of 25 per cent. in weaving and his workpeople worked 13 per cent. longer hours. Mr. Kempton, the manufacturer in question, recorded his firm opinion that if British hours were reduced to 10 instead of 12 per day, the United States would outsell England not only in markets abroad but at home. America was weaving cloths of 10s to 20s yarns which were baffling the English and Scotch, and a letter of Kirkman Finlay's tells that yarns of the kind were sold 22 per cent. cheaper in the States than in Glasgow. Kempton deposed that 16s water twist entirely made of good cotton in America sold at 21 cents per pound, while the English price for 16s out of waste and a little Uplands cotton was 22 cents.

In those days England had an import tax of 10 cents per 16 pounds of raw cotton and heavy taxes on flour and Lancashire was using steam at $62.50 per h. p. p. a. as against water power at $17.50 in the States. Freight, duty, insurance and importers' profits on raw cotton landed in Lancashire added 16 per cent. to its original cost. Specimens follow of the kind of letter that English salesmen were sending home:

(Rio de Janeiro) "We fear we shall be under the necessity of reshipping all the domestics we brought down. The market of Porto Alegre is completely overdrawn by the Americans in this article."

(Manila) "W. P. Paton reports 35,240 pieces, 36 inches wide, and 7,000 pieces, 28

inches wide, gray, of American manufacture; of British for the same period there were only 1,832 pieces."

(Aux Cayes) "In unbleached domestics the Americans are cutting out the British."

(Malta) "The Americans have in great measure driven the British article (cotton domestics) out of the market."

(Smyrna) "Almost 20,000 pieces have lately arrived, principally from America."

A Cape firm could not buy at the American prices from Glasgow. A Glasgow manufacturer doing his own spinning and weaving and selling through his own partners abroad was driven out of the Chilean market (1836) by competition from the United States. In 1834 there were 134,100 pieces of American long cloths and 32,743 of domestics imported at Canton as against some 76,000 pieces of British goods. And in 1834-5 nearly 24,000 American pieces were imported at Calcutta.

The difficulty was met in part by freeing the English ports and rounded by giving increased attention to finer counts and heavier sizings. The latter escape from competition has been followed ever since.

MILL ORGANIZATION

BY J. CROMPTON

From the Journal of the Manchester Textile Society

(Continued from April)

In the case of the warper's book, Fig. 11, the wage is based upon a certain number of pence per thousand hanks, of which the warper is aware, so that she may calculate the amount of her earnings at any time.

In the case of the drawer-in, the wage is based upon a certain number of pence per thousand ends. When a warp has been drawn in, it is of course conclusive evidence that it is ready for the loom; and in order to be ready at any time to report the exact position of each order or special design, it is advisable that the books be kept by the slasher, warper, beamer, or drawer-in be entered up at least once a week into what is often termed the progressive book, a page

Pro 604	Order
Date Oct 10/09	Shafts 3
Cloth 30 x 70	Warper 1
Picks 15	Beamer
Cuts 10	Drawer In 6
Yds Per Cut 100	Loom 98 Oct 13
Weft 20 Blue	
Pattern 60	
80 Blue	
4 Red	
84	
40 Patts	
3360	
33 Selv	
3393	
	Counts 20
	Reed 72/3
	Length 1000

FIG. 16.

of which is given at Fig. 12. If this progressive book is kept posted, it will at any time give the exact position of all warps and orders at a glance, and serve as a permanent record of the person performing each operation, together with the loom in which the cloth was woven and the dates upon which the cloth was brought into the warehouse.

This book also forms the basis of any reports which have to be made out from time to time regarding the position and rate of

Date Received	Delivery Bags	Cts Strips		Grey Weight 10 Bags	Examined	Date Tested	% Moisture	Counts	Length	Tested Length
17/11/09	40	2/6	X	100½	2 Ends	Nov 18	10·8	22·5	1728 Yards	1729
20/11/09	60	14	Y	99½	do.	" 22	8·8	13·7	1662 "	1680
22/11/09	50	40	S	101	do.	" 24	8·9	40·8	1692 "	1696

FIG. 17

weaving certain goods. In a well-conducted business, where the selling department requires to be kept accurately informed, with considerable detail, of the number of pieces in work and exact position of different designs, then a report may be given from week to week on a form as shown at Fig. 13. This form may be returned with an indication as to which particular designs it is desired special preference must be given. The rate of progress of each design may, of course, be noted by a periodical comparison of the weekly lists, which it has been explained are themselves compiled from the detailed order or progressive book.

The correct record in the progressive book of the dates upon which certain pieces are brought from the loom, depends upon accurate posting from the weaver's loom book, Fig. 14, which, it will be noticed, also serves as a record of the wages earned from a particular loom. When entering up the weaver's wage book from the loom book, the group of looms attended by any one weaver will, of course, be added together to form the complete wage. If alternate week's earnings are crossed off in different colored ink, it will be seen at a glance how much the weaver's average weekly earnings are from each loom.

The weaver's "tally" board, Fig. 15, must, of course, correspond with the entries into the loom book, as this is retained by the weaver during the weaving of the warp. Beyond this, there remains the keeping of proper clock stock and delivery books before the system is complete; but as this, together with the usual formal bookkeeping, is

Date	Skip	Counts	Mark	Wrappings (Grains)			Average	Actual Count
17/11/09	2272	36 Bl.	X	25	24	26	25	40
20/11/09	5226	50 Bl	Y	19	19	18	18·6	53·5
22/11/09	1842	12	S	83	82	84	83	12·04

FIG. 17A.

	Waste Per Winder											Pence Earned Per Lb. of Waste									
Date	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	11
1909	Waste / Hank																					
June 4	1½ / 46	1½ / 38	1½ / 34	1½ / 31	1½ / 30	1½ / 28	1½ / 26	1½ / 24	1½ / 23	1½ / 22	1½ / 21	137	104	93	84	102	98	98	139	100	116	92
11	1½ / 43	1½ / 36	1½ / 32	1½ / 29	1½ / 28	1½ / 26	1½ / 24	1½ / 23	1½ / 22	1½ / 21	1½ / 20	140	102	101	124	138	130	120	137	123	118	100
18	1½ / 40	1½ / 34	1½ / 30	1½ / 28	1½ / 26	1½ / 25	1½ / 23	1½ / 22	1½ / 21	1½ / 20	1½ / 19	137	133	73	97	304	95	100	-	116	100	126
25	1 / 43	1½ / 37	1½ / 33	1½ / 30	1½ / 28	1½ / 26	1½ / 25	1½ / 24	1½ / 23	1½ / 22	1½ / 21	152	136	107	118	151	131	148		163	106	135

FIG. 18.

Twist						Pirn					
Date	Total Waste	Total Lbs Wound	Wages Paid in £	% Waste	Lbs Waste per £ of Wages Paid	Date	Total Waste	Total Lbs Wound	Wages Paid in £	% Waste	Lbs Waste per £ of Wages Paid
1909 June 4	103 Lbs	5120	19	2·001	5·421	1909 June 4	118 Lbs	14.945	44	·789	2·681
" 11	110 "	7600	29	1·447	3·793	" 11	112 "	17,630	61	·635	1·836
" 18	112 "	8890	35	1·259	3·200	" 18	120 "	18.880	70	·635	1·714
" 25	106 "	9535	36	1·111	2·941	" 25	114 "	12,730	72	·724	1·583

FIG. 18A.

a matter of mere commercial knowledge, I do not propose to enter into it in any detail. Before closing, I must, however, draw your attention to a form or ticket, which it is advisable to write out upon strong paper, which may be expected to safely accompany the warp through its various stages. This ticket may, of course, take different forms, as is best suited to the particular class of goods being manufactured. One suggested form, suitable for shirting, etc., is given at Fig. 16. On it the warper's, beamer's, and drawer's number is duly marked by each person respectively, and serves as a double check upon the entry into their respective wage books.

Each person's wage must of necessity be entered up in the general wage book, but it will be noticed that the book filled in by each operative is also prepared in such a form as to make the wage calculation an easy matter. I should not, however, consider this address in any degree complete unless some brief reference was given to organize methods of checking the conditions under which cotton or yarn is received; and also some account of the way in which the amount of waste is made, and the mill stores consumed, may be recorded and compared from time to time in relation to wages earned or yarn and cloth produced.

So far as the former is concerned, Figs. 17 and 17[a] show useful forms of books, and give entries regarding yarn conditions which speak for themselves, while Figs. 18 and 18[a] show a method of recording winders' waste in relation to winders' earnings. These items have, of course, a vital bearing upon the cost of production and require careful attention, while it is also of great importance that the amount of oil, leather, and other mill stores used, should be duly recorded.

Fig. 19 makes mention of some of the items to take note of in a spinning mill, the cost of each of which may be worked out in proportion to wages earned in a similar manner to the more comprehensive list relating

RECORD OF CONSUMPTION OF ITEMS AS BELOW YEAR ENDING Dec 1907

	Engine House	Card Room	Spinning Room
Coal	360 Tons	"	"
Boiler Coats	120 Gallons	"	"
Cylinder Oil	120 "	"	"
Engine Oil	82 "	"	"
Mineral Oil	"	270 Gallons	540 Gallons
Tallow	168 lbs	292 lbs	208 lbs
Brown Waste	"	312	1344
Hand Brushes	"	76	44
Sweeping Brushes	1	16	24
Rim Shuttle Banding	1	"	800 lbs
Mule Banding	"	"	240
Roller Cotton Waste	"	1300	"

FIG. 19.

to loom stores, illustrated at Fig. 20.

The value of this list is not chiefly as a means of comparing the amount used by one overlooker with that used by another, but is very valuable in comparing the respective cost over a term of years during which some decided change has been made, as for example, changing from the use of oak tan picking bands to raw-hide or chrome bands, the introduction of some new form of picker, the value of the recently introduced automatic spindle lubricators, or the substitution of other items subject to wear and tear. In any case, however, I trust my remarks will be the means of causing each member of the Textile Society to realize that the industry with which they are connected is capable of having applied a highly organized system, which will not in any way act as a hindrance, but prove of benefit to both employer and employed.

Overlooker	T. Lucas	Oil	Reeds	Picking Bands	Buckles Quillers	Bowls Strings	Cops Strings	Jack Straps	Shuttles	Shuttle Tongues	Picking Sticks	Loom Cord	Spindle Bands	Spindles	Cards Strippers	Drawg Straps	Box Skeins	Top Box Buckles	Picking Stick Cups	Picking Stick Studs	Cop Weight Levers	Picking Sticks	Picking Rods	Ball Gauge Levers	Draw Hooks	Drawg Knives	Total	Weavers Earnings	Cost per £
Price	Each 1/6	Gall 10d	Doz 1/0½	Doz 2/6	Doz 1/3	Doz 1/6	Doz 1/3	Doz 1/6	Doz 1/2	Gross 3/6	Gross 10d	Yds 9½d	Gross 2/7½	Gross 1/3	Doz 7½	Doz 2½	Doz 2½	Doz 3½	Doz 3½	Doz 5½	Doz 1/6	Doz 1/2	Doz 3d	Doz 10½	Doz 2d	Doz 7		£	
Bleach		1/8	1/0½	1/0½	1/2½	1/6	1/0½	1/6	2/7½	4½	3/6	4½	6		5	2/4		2	3			1/2	3	8	8	1/2	54/8	216	3.43
Smith		1/5½	1/8½	2/6	1/2½	1/3	1/3	6	2/7	4½	3/6	5/6½	9	7	4	2/1	2	2	3	4½		1/2		8	8	1/9	49/9	210	3.47
Jones	1/6	1/8	1/0½	2/6	2/3	8½	2/6	3½	2/8½	4½	3/10	4/9	3	7	7	1/8	2	2	6		½		3	8	8	7	56/	214½	3.57
Fields		2/1	1/0½	2/6	1/0½	8½	1/0½	3/	2/4½	4½	3/6	5/6½		7	6	2/		2		4½			3	8	8	1/3	44/3	214	3.14
Lay	⅛	1/0½	1/0½	2/1½	1/2½	8½	3/6	3/6	2/9½	4½	3/6	5/6½	6	7	3	2/1	2	2	3			1/2		8	8	1/3	61/10	220	3.6
James		2/1	1/0½	2/6	2/3	8½	2/6	3½	2/9½	4½	3/6	5/6½	3		4	2/1	2	2	3					8	8	7	63/10	215	3.45
Totals	3/1	17/0	8/3	15/7	11/3	5/8	12/6	15/7	16/5	2/8	1/6	2/10	3/3	3/4	3/5	12/1	8	1/1	2/1	8	1/2	2/4	9	4/1	4/1	4/5	363/2	1289½	3.38

FIG 20.

EFFICIENCY OR SCIENTIFIC MANAGEMENT

BY EUGENE SZEPESI

(Copyrighted.)

(Continued from May.)

Waste is unnatural. Creation, when balancing the Universe, determined a certain use, a certain purpose, for every phenomenon and for every matter. The ordinary house fly which we consider today as a useless and wasteful creation, has a duty to perform just as well as any other creation. Its original duty, determined upon it by nature, was perhaps the transmission of organic matter from one place to another, thus balancing the quantity of living creations, which have been destroyed by the transmission of microbes. Human society in the present stage of civilization exterminates these little pests, not because they are wasteful but only because they are harmful. This is one extreme of the theory. We have many other reasons for making the statement that waste is unnatural and should not exist. By lifting that pencil, by brain through its nervous system, communicates the intention to the muscles of my arm, which again command my fingers and my arm to perform the suggestion or the command of my brain. It is possible to determine by computation the force required to perform this work, and if it were possible to measure the force exerted by my muscles and my fingers, we would have absolute proof that the force in question developed this absolutely in proportion to the force required, provided the communication is of a sound brain.

Here is another proof that nature itself balances the organic matter to perform certain duties in proportion to the requirements. The undisputed theory that you cannot destroy matter shows clearly the unnatural origin of waste. The above examples should serve as sufficient proof and reasoning, so that we can enter into the purely human phase of the matter and discuss the wastes, their origin, their psychology, connected with the economic question of human life, namely, the creation, distribution, utilization and consumption of wealth.

An ordinary pine board, a few inches wide and a few feet long, may lie on a highway for years before anyone in our country would consider it worth the while to carry it to his house, no matter how near it may be. It is an unrisputed fact that in every house an ordinary board like that would have many uses, if for nothng else than for firing purposes this substance could be utilized, and increase the individual wealth to a certain fraction. In our conditions this fraction is so small that it would take a human on the lowest degree of wealth productivity, to consider that piece of board. So it is wasted, a certain thing which could be utilized.

In the Arctic regions, where wood is very scarce and therefore its intrinsic value very high, any Eskimo is willing to travel a half a day to secure this piece of board for which he has numerous uses, and it would represent a gain in wealth to him. Now let us reverse the conditions. If such a condition should arise that ordinary washing soap was scarce, I would be willing to pay many times over its actual value in order to obtain it, as the possession of this useful article is almost a life question. I may throw out a barrel full in an Eskimo community where this useful article is very scarce, yet if I should imagine that they are going to fight for the possession of it I am greatly mistaken. Under the best circumstances they would, may be, accept my gift with curiosity and consume it as an after dinner dessert, which would actually mean waste, as even an ostrich could not claim beneficial and tissue building effects from a substance which is a combination of carbonates and alkali. So my Eskimo friend would waste a useful article, not utilizing same for the purpose intended. If he would use it in the same idea as I do, the pores of his body would enjoy the blessings of hygiene.

While searching for the psychological reasons which would account for the attitude of the American cotton manufacturer toward their waste production, my investigations resulted in the following conclusions:

The building up of our textile industry, speaking specifically, of our cotton industry, has taken place under conditions for which

we cannot find a precedent in any other nation's industrial development. For the last half century the United States has been a country of constant increase in wealth and in population, for which reason the progress of industrial development has taken place at the highest possible speed. In a comparison between the three leading industrial nations of the world today the United States stands at one extreme, Germany stands at the other and England is placed between the two. The German is conservative, slow in creation but progressive in development. That old German proverb, the motto of the German manufacturer, "Billig aber schlecht," or "Cheap but Inferior," is a matter of the past, as even in cotton manufacture Germany stands for the highest development of the industry and we can, without hesitation, bring this nation up as an example of how to utilize, how to create cotton products to the best advantage. Now between the two extremes stands England, the original land of cotton manufacture, with its immense production which leads the world even today and will lead for a considerable period. The Englishman is more progressive. He is apt to accept ideas if they are reasonable. He is willing to develop new lines and is quite careful in the way he utilizes his material to the best advantage, but he lacks that certain thing with which the German is gifted, namely, the thoroughness with which an industry or any branch of it is developed.

Now we come to the other extreme; a nation of growing Titan giants, with the wit of the Irish, the keen eye of the Oriental, the cool determination of the Norman, and with an opportunity to develop an industry quickly, which is not given to any other nation. The result is that the question of thorough utilization is a secondary issue. It was a secondary issue; it isn't today any more, as the value of raw material for the cotton industry has reached a high figure and we cannot expect within a reasonable period a reduction which would bring forward the past conditions. We have our cotton in our own land; cotton which leads in quality and the utilization of which is much more facile than any other grades in the world. But conditions are changing. The cotton supply is increasing in fact, but the demand increases also and the line is above the supply line, therefore we have to follow the examples of England and Germany and utilize our cotton to a better extent. Taking our cotton consumption in the United States to be about 4,500,000 bales, a reasonable deduction is, that the waste having a utilization value amounting to about 8 per cent. of the original consumption, would amount to 180,000,000 lbs. According to the government statistics of this, about 40,000,000 lbs. has been exported to Germany and England. Taking the average value of the cotton waste to be about 4 cents per pound, the 120,000,000 lbs. assigned for domestic consumption would bring to American manufacturers about a half of a million dollars. Lacking authoritative statements I could not obtain actual figures, but I find it reasonable to state that the American manufacturer does not get two-thirds of this amount through the indifference and improper handling of the waste. The one-third of our yearly production of waste which goes to Europe and is manufactured into marketable articles will bring the German and English manufacturers, according to my estimation, more than the American manufacturer gets for his cotton waste from the American consumers. What is the reason of such conditions? The answer is clear; the lack of proper utilization.

I had an opportunity to examine the waste of several American mills and found out that the value of the waste has been artificially decreased by the improper handling in the mill. I made some notes of a lot of sweeping waste gathered from the flyer room and the mule room, which contained 30 per cent. of such substances for which I could not find the slightest excuse. From this lot of waste, which I presume was carefully selected so as not to give me the worst part, I extracted one-half of a sour pickle, chewing tobacco of different grades, varying from Long Cut Navy to Irish Plug grades. I guess this came from the spinning room. I also found in this waste the well used re-

mains of spearmint and tutti-frutti, which I presume represented the ladies' chewing ability in the flyer rooms. The mule spinners also generously contributed to this collection with something else which is the consequence of tobacco chewing and this is neither agreeable nor sanitary. I also found plenty of cup tubes, nails, paper strips, wood scrap, iron scrap, broom straw, and to reward my troubles for a thorough investigation I also found a solitary penny. The remainder of the waste was matted together to such an extent that I could not place the value of this waste at more than 1 1/2 cents per pound, when same, if properly handled, which could be easily done without any additional expenditure, would be worth 4 1/2 to 5 cents per pound.

Now let us consider the way in which this cotton waste is utilized today in the United States and how it is utilized in England and Germany. Our cop waste is readily absorbed by the railroads for wiping purposes. In the way they use it the actual efficiency of this waste never reaches 70 per cent. and in many cases is as low as 30 per cent. If this waste could be handled in the way it is done in England and Germany, especially in Germany, the value of service of the wiping waste would be increased from 150 to 200 per cent. over the present efficiency, or summing it up, two-thirds of the waste consumed by the railroads today could be utilized for other purposes. I felt considerably chagrined when on my last year's visit to Germany a cotton waste manufacturer showed me a wiping cloth for which he received a good sized order from the United States. This cloth was made of cotton waste which had been imported from the United States, put into a marketable article and sent back to the States again with its value increased almost 200 per cent., which entire amount went to the credit of a foreign manufacturer.

Once I was cornered by a German waste manufacturer with the question, "What are your methods for utilizing cotton waste?" I had to confess that our methods are to get rid of it as a burden. We have several manufacturing concerns who manufacture cotton waste into marketable articles. They are making a success of it, but they don't utilize one-tenth of the total material at their disposal. A well known article made of cotton waste is the teamsters' glove, of which I bought a pair for ten cents and the manufacturer of which introduced with this article a very desirable product. Another article which is converted from cotton waste in the States today is a soft twisted yarn utilized for cheap fleeced underwear. It is a success too. The wiping mops are well known to us. That is about all the Ameican waste manufacturer is bringing on the market.

Now let us see what the English and the German manufacturer is doing with the cotton waste. I have a sample taken from a cheap curtain, the warp of which is a low grade Indian cotton and the filling cotton waste. This curtain could be produced in the United States cheap enough to make it popular. Everyone of us is familiar with the law of supply and demand, according to which the demand for a certain article increases in proportion to the decrease of cost of production. In our industrial as well as rural district, 90 per cent. of the population has a limited pocketbook. There are many millions who have an artistic sense and would appreciate a portier or couch cover, but they cannot afford the price today. If I could produce a couch cover or a table cover at 50 cents apiece I know I could sell many, and how many are here today who are paying a certain price for a certain article who would not be glad to pay less for it if an opportunity was given them. Another interesting article which can be used for cheap house decoration purposes, has a filling of the lowest grade of waste, which has been bleached and filled with China clay to such an extent that it makes my hands white, is extensively used in Italy. With some alterations a very cheap but still serviceable bed cover could be easily made and find a ready market in the United States. Another bed cover or table cover of a honey-combed texture would find a ready market. Flannels with cotton waste filling, if properly manufactured, could be made sanitary as well as serviceable. Carpets are to a great extent manufactured of cotton waste, then printed and sold for a song.

(To be continued.)

BOILING OFF SPUN SILK

BY JAMES CHITTICK

In the discharging of the gum of the waste silks by boiling-off, a treatment with boiling liquors of soap and water may be employed, looking to the stripping of the silk as speedily as possible, or, if time be not an object, a method may be adopted of soaking the silk in hot liquors, giving it the least boiling consistent with the thorough discharge of the gum.

The boiling can be done in wooden tubs, or vats, of which a convenient size would be about six feet in depth and four or five feet in diameter, the vats having perforated false bottoms through which steam passes from pipes coiled underneath them.

The silk should be well opened up so that the liquor can penetrate it easily, and then should be put into strong bags made of some material with a large open mesh, and the mouths then tightly tied up. About three-quarters of a pound should be put into each bag, and the bags should be very roomy as the silk will swell up.

In the bottom of a vat, a couple of feet of soft water will be let in, and to this will be added ten to fifteen pounds of white curd soap, finely shaved, which must be well boiled up by turning on the steam until the soap is thoroughly dissolved, when the temperature should be run down to 180° F.

The soap used should be of the best quality, and white olive-oil soap is excellent for the purpose. A good curd soap may contain 15 to 25 per cent. of moisture, and, of the remainder, about one-seventh should be alkalies, etc., and the rest fatty matters.

Into the bath, so prepared, about one hundred and twenty pounds of silk waste, put up in bags as described, should be entered, and, as the bags have at first a tendency to float, they must be kept pushed under with a pole by the attendant until they are thoroughly wet through, when they will stay down of themselves.

The liquor should now just cover the silk, and the steam should be turned on, and the first boiling commenced.

On no account should the silk be put into water that is already boiling, as it will have the effect of fixing any dirt and coloring matter upon the fiber. Violent boiling should also be avoided as it injures the silk.

While the boiling is in process the movement of the water will cause the bags of silk to constantly change their positions, and this movement should be assisted by the attendant, who should see that the bags are constantly turned over and over and kept on the move, using a suitable implement for this purpose. He must give this matter his strict and continued attention, as the constant turning of the bags is of great importance if the silk is to be well and evenly freed from its gum and from its coloring matter.

After the boiling has continued for an hour or two, the steam should be shut off, and the liquor allowed to escape, after which the bags are put in the hydro-extractor and the gummy and dirty water whizzed out of the silk. If, however, the waste that is being treated has much chrysalis in it, better results may be had by running the bags through squeeze-rolls, which crushes out these objectionable matters.

Another vat has now been prepared for the second boiling. This will be half filled with water, and some fifteen pounds of shaved soap will have been melted and boiled up with this, and the temperature, as before, will have been run down to 180° F.

The bags of silk from the hydro-extractor are next placed in this and steam is turned on, and the boiling is continued for from an hour to an hour and a half. During the process the attendant must be as alert and as watchful as before to see that the silk is constantly kept in motion.

The bags are then removed and whizzed again, after which it is an advantage to open them and put the loose silk into a tub of clean water, heated to 180° F., in which it is well rinsed from its soap, after which it is again whizzed and dried.

The liquor from the second boiling can be saved and used as a bath for the first boiling of another lot.

If time is not a consideration, the silk can be well opened up, as before, and put loose into the first bath and kept there, without movement, for from six to ten hours, at 180°

F., no boiling being given to it, and in this way the gum can be suitably softened. Then the silk will be squeezed out and put into the second bath, in which it will receive the same boiling as already described. Should a specially white color be desired, a very small amount of blue coloring matter can be added to the second bath, which will neutralize the natural creamy shade of the silk. If the wastes being treated are very dusty and dirty, a preliminary washing, before the first boiling, in a bath of warm water containing a little ammonia, is a great help, as it clears off the grease and dirt and materially helps to give the silk a good white color.

QUALITY	Weight in Gum lbs.	First Boil Time Mins.	First Boil Soap lbs.	First Boil Chemicals lbs.	Second Boil Time Mins.	Second Boil Soap lbs.	Second Boil Chemicals lbs.
Home China	120	60	9	—	90	11	—
Italian, French, and Swiss gum wastes	120	120	18	—	150	16	—
Canton gum and steam wastes	120	80	10	—	75	12	—
Curlies, Knubs, and Kikai	100	60	10	—	60	10	—
Shanghai, punjum books and waste	120	90	11	2	60	15	—
Indian wastes	100	60	12	—	60	12	—
Tussah Knubs and throwsters' waste	100	90	10	4	60	12	—
Tussah cocoons	100	120	13	6	80	7	4

There are various machines on the market that will be found suitable for the important drying process. The silk must be well opened up and evenly and thinly distributed over the heating surfaces, and the drying must be very thorough and be very evenly done. This process requires great care and must not be slighted if good results are to be looked for.

Mr. Hollins Raymer, the English writer, in his excellent book, "Silk Throwing and Silk Waste Spinning," gives a very useful table of "Recipes for Boiling" which it will be interesting to reproduce here. Regarding this, he points out that the soap must be of good quality and the water very soft, or the proportions of soap used, and even the time occupied in boiling, will have to be altered. The chemicals are salts of tartar.

The first and second items are both throwsters' wastes, but the first, which is thrown in England with soap, requires, naturally, both less soap and less time for softening than the wastes from Continental throwing mills, in which it is not the practice to use soap, but in which insoluble compounds are not infrequently added to the silk prior to winding.

Each class of waste requires a special study and much experiment if the best results are to be arrived at.

Silk for spinning can be freed from its gum by a variety of other methods, the most important of which is the well known schapping process. Then the waste silk may be treated with acid, or the gum may be discharged by an alkaline process, sometimes by merely a soaking for a few hours in an alkali bath, without any boiling-off.

After the silk is thoroughly dried it should be quickly and carefully weighed, and, if 11 per cent. is added to the bone-dry weight of the material, its "conditioned" or normal weight will be arrived at.

It is very important to work this out for each lot so as to know just what the yield has been.

For this, also, Mr. Rayner gives the following interesting table:

Quality	Weight to Boil	Weight from Stove
Home China	100 lbs.	66 to 69 lbs.
Foreign China	100 "	70 " 75 "
Canton Gum	100 "	70 " 72 "
Steam Waste Knubs	100 "	59 " 62 "
Curlies and Kikai	100 "	69 " 74 "
Fine Shanghai	100 "	72 " 75 "
Coarse Shanghai	100 "	70 " 72 "
Indian wastes	100 "	66 " 70 "
Punjum Books	100 "	52 " 55 "
Tussah	100 "	72 " 80 "

In conclusion, it may be said that only intelligent workmen should be employed in the work here described, and careful inspection should be given the silk as it comes forward, and any not properly degummed should be taken out and done over.

The number of flax spindles in France is about 500,000 and of linen looms about 18,700.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

NUMBER OF OPERATIVES REQUIRED IN A CARD ROOM

Editor Textile World Record:

Kindly give me a list of the operatives that would be required in a cotton card room having 60 cards. Kansas (1890).

The number of operators required in a cotton card room having 60 cards depends very largely on the class of work, stock and the counts to be made, also whether the yarn is to be combed or only carded. We will assume that it is a modern card room conveniently arranged and using 1 1/8 inch midland cotton for 5 hank roving, the products of the cards to be 100 pounds per day.

The picking would require three breaker pickers, four intermediate pickers and four finisher pickers. If a bale breaker is used and delivers into automatic feeders, one man would be required to open the cotton and run the bale breaker and automatic feeders, one man on breakers, one on the intermediate pickers and one on the finishers. There is one boss grinder and two helpers. The boss grinder is also the picker boss. There should be four men to tend the cards.

For three processes of drawing, 40 deliveries, each process would require six drawing tenders. Six slubbers, 12 by 6, of 60 spindle would require three slubber tenders. Twelve intermediate speeders, 10 by 5, of 108 spindles each would require six speeder tenders. Twenty-four fine frames, 7 by 3 1/2, of 160 spindles each, would require 12 speeder tenders. There should be one roving packer, one oiler, one spare hand, one third hand, one second hand and one overseer, making a total of 34 hands.

As stated above, this is to make about 5 hank roving and is, I believe, a fair list. In some cases more help would be required as it depends very largely upon conditions and yarn. If one has to teach the help, he would need two or three coming alone so as to keep things going. Minto.

TEMPERATURE FOR DRYING HOSIERY

Editor Textile World Record:

What is the best temperature for drying hosiery previous to boarding? We want the goods left in the best condition to secure a finish. We make 176 and 200-needle carded mule spun and mercerized goods. Craigie (1905).

A low temperature of 70° or 80° F. is best. Spread the stockings in an open box drier on wire screen shelves and force all the air possible through them from a large fan at the bottom of the drier. Stir the goods up occasionally to prevent their drying out in spots. This also tends to prevent marks where they are creased or folded. This is an excellent method, because it allows the boarders to get out a good production on a moderate heat.

To obtain the best results do not let the hosiery lie around wet after it comes from the hydro-extractor. Winwick.

WEAVING TURKISH TOWELS

Editor Textile World Record:

Please give me some information in regard to weaving Turkish towels. I would like to know what sort of a loom is used for weaving Turkish towels or terry cloth. What is terry cloth? Is it necessary that the loom be a 4 by 1 box loom? What reed space is required and what is the best loom to purchase and how many harness looms are necessary? What is the terry attachment on a loom? Is it similar to what is known as the multiplier? Weaver (1903).

Turkish towels are woven on cam or roller as well as dobby and jacquard looms, any style of looms, of course, having the Terry motion attached. Terry cloth is a single fab-

ric having loops of warp yarn on one or both sides in regular or irregular order. It is not necessary that the loom be a 4 by 1 box loom unless it is desired to weave color effects.

Turkish towels are usually woven 24 inches wide on a 27-inch loom. They can, however, be woven on a broad loom, in 2, 3 or 4 inch width by having a split selvage attachment. The number of harness required depends all together on the design to be produced.

The Crompton & Knowles loom contains the Terry attachment besides a box motion for inserting different colors or kinds of filling; a motion for making fringe at the end of each towel; a motion for changing the weave from Terry to regular construction at the beginning and end of each towel; this is usually accomplished with a device which automatically brings into play the pattern chain required.

The Terry attachment on a loom will allow two (in a three pick Terry) out of three picks to be beaten up to within a certain distance of the fell of the cloth, the distance depending on the length of pile desired, then forcing these two picks along with every third pick to the fell of the cloth. To accomplish this result one of the following methods is commonly adopted: By a rocking or oscillating reed, which is held back or forced to the fell of the cloth as desired, or by a rocking whip roll and back roll Terry motion. With this device the reed is held firm, the cloth being moved back toward the rear of the loom every third pick.

Manx.

INCREASING WEIGHT BY SIZING

Editor Textile World Record:

Can the weight of grey cloths, such as 36-inch, 48 by 48, 3-yard sheetings, and 36-inch, 48 by 52, 4-yard sheetings, be increased 20 to 25 per cent. by increasing the sizing on the warp yarn as made at the slasher? If so, what ingredients should be used and the quantity of each? What should be used to avoid injury to the cloth?

Gilbert (1911).

The weight of cloths, such as your correspondent mentions can be increased by sizing the warp with a size mixture containing weighting ingredients.

The following mixture will add about 25 per cent. of weight to the warp:

100 gals. water.
120 lbs. potato starch.
60 lbs. dextrine.
40 lbs. epsom salts.
60 lbs. China clay.
2½ lbs. chloride of zinc.
3 qts. bleached palm oil.

Forfar.

POWER FOR MACHINES

Editor Textile World Record:

I am looking for information as to the amount of power required to drive various machines used in cotton, carded woolen and worsted mills. Can you help me? Power (1280).

The information is obtainable from machine makers and has been summarized in respect of various machines by S. Eoroyd in the Cotton Year Book and A. F. Barker in the Wool Year Book. A few particulars from those sources follow. It will be understood that the figures are in some cases approximate rather than exact and that the power required varies with different makes of machines and with the number of moving parts.

Cotton.

	I. H. P.
Bale-breaker (48 in. machine)	2
Opener, single beater	4
Double beater	8
Revolving flat card (50-in. cyl., 24-in. doffer, 105 flats, 38 in. on wire)	.52
Roller and clearer card (38 in. on wire)	.66
Doubler and lap machine	½ to 1¼
Heilmann comber (8 head)	⅞
Nasmith (6 head)	.76
Drawing frames, 12 deliveries	1
Flyer frames, slubbing, 46-52 spindles	1
Intermediate, 60 spindles	1
Roving, 70/80 spindles	1
Fine-roving, 90/100 spindles	1
Ring frames (require 20 per cent. more power than mules), 344 spindles on 28s counts 4s travellers to drive spindles only	1.89
to drive bobbins empty	2.98
to drive bobbins full	3.28
Mules for low American cotton, 110 spindles	1
for medium cotton, 120 spindles	1
for fine counts, 125-130 spindles	1
Self-acting twiner, "English" or moving-creel type 200	1
"French" or stationary-creel type 150	1
Ring doubling, dry-doubling 50	1
wet-doubling 45	1

Winding, Split-drum type, single-end, 120 drums	1
Split-drum type, stop-motion, 70 drums	1
Thread-guide type, 120 drums	1
Self-contained type, per head	⅓
Gassing frame, about 80 drums	1
Warp winders, vertical spindle, 300 spindles	1
Filling winders, 120-160 spindles	1
Slasher sizer	1½
Looms, plain or Northrop	.16
Worsted.	
Wool-washing machine, per set	8
Preparers	1-1¼
Worsted cards	3
Backwashing machine	4
Comb, Noble, 3 circle	3-4
Gill boxes	½
Cone-drawing machines, 8-spindle	3
40-80 spindle	5
Cap spinning frame, 200 spindle	5
Flyer spinning frame, 144 spindle	3
Carded Woolen.	
Rag grinding machine	5-6
Willows	3-4
Cards (according to widths)	4-6
Garnetting machines, one swift 48 in.	⅝
two swift 48 in.	1¼
three swift 48 in.	1¾
Mule	1½

Regent.

SCROOPING OF MERCERIZED HOSIERY

Editor Textile World Record:

In the May number of your paper under the head "Scrooping of Mercerized Hosiery," there is an article signed by "Howell" with which I do not agree. Cotton cannot be scrooped according to his method. It is not possible to give the cotton the property of having a scroop without the use of a soap bath previous to applying the acid solution. If, as stated in "Howell's" formula, use is made of 3 to 5 per cent. of acid, figured on the weight of the material, there will be no appreciable result at all, whereas if enough acid is used to produce a definite feel, the cotton assumes a very harsh, stiff condition which is most disagreeable to the touch. The soap is necessary on account of its softening properties. Inasmuch as it is "broken" by the acid, the ordinary greasy feel, which it would ordinarily exert, is overcome and the result of the combination of the acid and soap produce what is wanted, a crackling, rustling sound and a peculiar feeling to which has been given the name "scroop."

A comparative trial by anyone interested, using the acid once with and once without soap will convince the most skeptical as to which is the proper method. "Howell" also speaks of tartaric acid as liable to hurt the cotton fiber on account of forming sharp crystals when dry. This is theory and does not injure cotton when applied correctly, that is, in conjunction with the soap.

Renmark.

SUGGESTION FOR THE TEXTILE SCHOOLS

Editor Textile World Record:

While the best mill men give much care and study to their purchase of raw cotton, yet very few, if any, can readily tell the percentage of waste a given sample of cotton carries. In other words, they do not know the intrinsic difference in the value of the various grades of cotton.

The New York Cotton Exchange, taking middling cotton as a basis, puts the value of good middling at 44 points, or nearly 1/2 cent per pound above middling in value, and in this arbitrary manner they settle the corresponding value of all other grades. These variations are known as "fixed differences" on the New York Exchange and are fixed at stated periods during the year.

In the spot markets of the South these differences usually follow more or less the supply and demand of the various grades at the respective cotton centers. The New Orleans Exchange attempts to follow the spot cotton situation more closely, and places values on the various grades each day, which system is known as "commercial differences."

We have the "fixed differences" and the "commercial differences." What I would like to see established is the real "intrinsic differences." This can best be done at the textile schools by giving the students as a graduating thesis bales of various grades of cotton, with instructions to manufacture the cotton into a simple cloth, making the same construction of cloth in each case and having all machines with the same settings. The careful weighing of the waste at each process would certainly give data of great use to the mill man. If the various schools would tabulate their results, the "intrinsic difference" would be established.

Saxon (1921).

The suggestion made by your correspondent that much desirable information could be gained by careful tests made in textile schools or cotton mills, to determine accurately the percentage of waste which a given sample of cotton carries, seems to me to be a good one. It is surprising how little is understood in regard to this important matter of waste in cotton, even by the best of mill men, very few of whom have ever made a test of this kind.

The following figures are the result of a careful test made in a yarn mill to determine the percentage of waste taken out in picking,

carding and combing working Egyptian cotton for hosiery yarns:

Kind of cotton	Egyptian hosiery
Number of bales	2
Total weight of bales .....lbs.	1,529
Tare of hoops and bagging	43½
Tare of hoops	33
Tare of bagging	10½
Net weight of bales	1,485½
Cotton put through openers	1,485½
Visible waste in openers	31½
Visible waste in finishers	14½
Visible waste in openers and finishers	46
Pounds of laps delivered by finishers	1,340½
Cotton put through openers and finishers	1,485½
Cotton received from openers and finishers	1,340½
Total loss in visible waste	46
Total loss in invisible waste	99
Total loss in opener and finisher ...	145
Per cent. of loss in openers and finishers .....%	9.76

Cards

Cotton put through cards .....lbs.	1,340½
Total visible waste in cards	92
Total invisible waste in cards	10
Total loss in cards	102
Per cent. of loss in cards .....%	7.6

Combers

Cotton put through comber ....lbs.	1,187¾
Cotton received from comber	931¼
Total loss in waste	256½
Per cent. of loss in combers .....%	21.59
Per cent. of loss in pickers, cards and combers	38.95

Forfar.

PRICES PAID FOR KNITTING HOSIERY

Editor Textile World Record:

Would you please give us the prices usually paid for knitting ladies' one and one rib hosiery on 184-needle machines, that is, 92 needles in the cylinder and 92 in the dial? We woul dlike to have the price for the ribbing, topping, transferring and knitting. Knitter (1904).

Ribbing is usually day work. If the work is black and the topper does 20 dozen per day of 10 hours at 8 cents a dozen would be $1.60 per day. If the machines are full automatic and the knitter can turn off 40 dozen a day, he could make $2.00 at 35 cents per dozen. Winwick.

PRICES PAID FOR TOPPING AND LOOPING

Editor Textile World Record:

Please let me know the prices manufacturers are paying for topping and looping 220-needle half hose. Wilton (1923).

The cost of living and the ability to get help plays an important part in determining the prices paid for topping and looping hosiery in different localities. Assuming, however, that the mill is in the average city and that the machinery is fairly up to date, the prices would be about as follows:

Topping, $0.06½ to $0.07 per dozen
Knitting, .06 to .07 per dozen
Looping, .07½ to .08 per dozen

These prices are only approximate and I do not think it is possible for anyone to get them exactly right without being on the spot and knowing all the conditions. It must be remembered that these operations, especially looping, require skilled labor.

Orlando.

I am paying 14 cents for topping and knitting 220 needle half hose; for topping and knitting ladies' hosiery, doubling 100 stitches, 20 cents per dozen; and for looping, 8 cents per dozen. Clinton.

The lack of definite information makes this question a rather difficult one to answer. The most important of all things to be considered is the location of the mill. In some towns operatives earn from $4 to $5 a week, while in other places they will make $8 to $9 for topping and looping. The cost of knitting and topping fluctuates between 9 and 14 cents a dozen, and for looping between 4 and 7 cents a dozen. Linden.

At one mill where I was employed we paid for looping 176 needle hose 3 1/2 cents, and for 200 needle hose, 4 cents. For knitting, we paid 4 cents for 176 needle goods and 4 1/2 cents for 200 needle goods. For topping, 3 cents for 176 needle goods and 3 1/2 cents for 200 needle goods.

At another place the price paid for misses'

hosiery was 5 cents for No. 5s with a 1/2 cent raise on each size up to No. 9 for knitting and topping fine goods, and 4 1/2 cents for looping. Prices vary with location, but they are always lower in the South than in the North, but the help is generally not so skilled in the South. At present there are not many mills in the South who are making 220 needle goods, but they are now starting to put more of these machines in.

Harper.

—÷—

JET BLACK ON HOSIERY

Editor Textile World Record:

Kindly give me a method of producing on oxidized black hosiery a nice jet blue black, and also state what would be a good softener to use that would not turn the goods red, but leave them with a soft feel. Also give me an oxidize black formula that will lisle the goods with little change of tendering. Williams (1918).

It is difficult to recommend a formula for dyeing an oxidized aniline black without knowing the details or conditions under which it is to be applied, but for ordinary hosiery the following should yield a good full, rich black with a tone just inclining to the blue.

Prepare a solution as follows:

Bluestone .....lbs.	45
Chlorate of Potash	30
Sal Ammoniac	12
Verdegris	6
Aniline Salt	130

dissolved in a sufficient quantity of water to stand at 14° Tw.

Pound the goods for 3/4 of an hour at least, and do not extract too dry, at least an amount of water equal to the weight of the goods should be left in the goods. Chroming should be done in a bath prepared with 5 per cent. of bichrome, and about 20 minutes allowed for the operation. Oxidation should take place at about 100° at most. To exceed this temperature is dangerous. Do not forget thorough washing.

For softener, any good soft soap or soluble oil is valuable for the purpose. There are any number of manufactured "softeners" on the market, but as the basis of them all is soft soap, the dyer can buy a good soft soap and use it without difficulty.

Lisling, as applied to black hosiery, is the result of friction applied to the dyed material when subjected to the "oxidizing" process, causing a removal of the fine fibers always on the surface of the goods. No dyeing formula will supply the means of giving a lisle finish. Cromarty.

—÷—

SPECKS IN COTTON YARN

Editor Textile World Record:

Is there a machine or apparatus that will take out the specks in cotton yarn and make the goods look brighter and better? I enclose samples of the yarn and goods. Chapman (1898).

I do not know of any machine that will take the specks out of cotton yarn after it is spun. These specks come from the leaf of the cotton plant and are always present more or less in the inferior grades of raw cotton. The machinery which prepares the raw cotton before it is carded and spun should remove all this foreign matter which causes the specks, but if the machinery is not in good order, some of the specks will adhere to the cotton and come through in the spun yarn. In the cloth and goods which we use to dye or tint Egyptian color, and which is always washed or scoured first, using a good scouring soap so as to take out any greasy matter that might be in the cloth, we find that the boiling of the cloth in soap and water removed a very large percentage of the specks.

"Manheim" can try the washing of the goods. At the same time a complaint to the yarn manufacturer might help to get yarn with less specks in it. The scouring of the goods will also make the cloth look brighter, owing to its having to be dried with artificial heat and run over spreaders and rollers.

Lafayette.

The specks referred to, in sample of yarn and knitted fabric, seem to be mostly small pieces of seed or hulls with tufts of cotton clinging to them. The place to get these specks, or motes, out is on the pickers and cards. "Chapman" could improve his yarn in this respect by more careful picking and carding. I know of no machine or process that will do this work after the yarn is spun. Polishing or brushing would do it but this is not practical with hosiery yarns. It is a de-

fect the remedy for which must be applied before the cotton is converted into yarn. If the material, after knitting, is passed through a brushing machine a good many of the specks would be eliminated. Steuben.

DYEING HOSIERY

Editor Textile World Record:

We are making plated hosiery, that is worsted plated upon cotton. We color our cotton yarn black with sulphur black dye and dry it at a temperature of about 200°. This cotton yarn colored and dried as above we use with worsted yarn, part of which is all worsted and part about 50 per cent. of cotton and 50 per cent. worsted, but how the cotton in this yarn is colored we do not know. We color these goods with an aniline dye, using formic acid. We dry these goods in a temperature of about 200°. We have been led to think that possibly in the coloring, the coloring or the head or acid might tender the yarn or goods and we wish to do something at once to have this remedied so that the yarn when colored will be just as strong or nearly as strong as when in the white and that our goods when colored and dried will be as strong as before coloring. We wish to ascertain if you know anything in regard to the workings of sulphur black, also the workings of aniline in connection with formic acid, and if the temperature would have anything to do with developing the acid or oxydization which might weaken the yarn or goods. Adam (1916).

From the above question it appears that this manufacturer uses two kinds of yarn in combination with the cotton yarn which he dyes in his own dye house with a sulphur black. One of these yarns being all worsted and the other being composed in part of cotton and part worsted, the cotton of this thread being dyed by a process unknown to this correspondent. In cross-dyeing his material, he uses an "aniline dye" together with formic acid, and wishes to know what influence formic acid has on the sulphur bleach and the aniline, and whether there is likely to be a tendering of the cotton.

Formic acid has no destructive action upon wool or cotton in the dye bath, its action being in the case of ordinary acid colors that of an assistant, causing a gradual taking up of the color by the wool from the dye bath. It is seldom used in cotton dyeing. Properly dyed sulphur blacks are not acted upon by any ordinary mineral or vegetable acids, so that no fear need be entertained as to tendering of the goods after dyeing if reasonable washing is given. As a precaution after dyeing sulphur colors, a few ounces of sodium acetate for 100 gallons of final rinse water may be given. This will remove all tendency of the sulphur bleach dyed material to become tender. Beta Napthol.

FINISHING TRACING CLOTH

Editor Textile World Record:

In the May issue of your magazine I noticed an inquiry about the finishing of tracing cloth. The reply refers to rather an ancient method. It is not at all necessary to treat the cloth before sizing, providing the cloth is in proper order with straight threads of the necessary width. The cloth before sizing should be about 2 inches above the finished width. The following sizing solution should be used: 80 lbs. flour, 60 lbs. farina, 40 lbs. corn starch, 15 lbs. tallow, 2 gals. alum (liquid), 16 fluid ozs. of bleachers' blue. These 100 gallons (834 lbs.) of water is added and the materials are well mixed before boiling. Add the tallow in melted form just before the mixture comes to a boil. Stir well. Put the cloth through this size once and if possible dry and stretch at the same time to one inch above finished width, then size again and dry twice. Let the goods cool, then damp and leave them over night. Calender on a friction calender, not too hot, but with plenty of weight. The more weight that is put on at the first calendering the better. If the goods are not closed enough for one run, slightly dampen and calender again, adding a little more heat. At the third calendering put on all the heat and weight possible. The goods should then be finished with a well glazed and almost transparent face and plain back. Size the goods three times and calender three times with the above mixture and that is all that is necessary for a well finished tracing cloth.

Montrose.

The exports of cotton goods from Germany during the first three months of 1911 amounted to $33,146,822, an increase over the corresponding period of 1910 of 7.3 per cent.

Knitting Department

KNIT GOODS SITUATION

The past month has been a busy one in the knit underwear departments all over the country. Weather conditions have been propitious for good business and retailers and jobbers have had excellent trade on all lines of light wights.

Jobbers report that there has been very little done during the past month on advance business for fall, but this is not much different from other years, as very little is usually done in the month of June on heavy weights.

Practically all lines for 1912 have been opened since our last writing and it is said that some fairly large orders have been placed by the buyers for some of the larger Western jobbers who made early visits to the New York market. Manufacturers' agents have all made their trips through the West and while the business taken by them on the road has not been of large volume, a great deal of preliminary work has been done that will lead to orders being placed when the buyers come East after July first.

More stress is being placed on the quotations being made on men's 25-cent balbriggans than on almost any other line. Most of these are being sold at the same quotations as were made last year. It was expected by many that an advance of about 10 cents per dozen might be had over the 1911 prices, but there seems to be a tendency on the part of a number of manufacturers to take chances on the raw material conditions. As a result prices of $1.70 to $1.90 are ruling for balbriggans, weighing from four to five pounds.

The Tempest Knitting Co., of Perry, N. Y., are showing a line of four-pound weights at $1.70, 4 1/2 pound at $1.80 and five-pound at $1.90. The Perry Knitting Co. have a garment running about 4 1/4 pounds in weight that they are selling at $1.75 and also a five-pound line for which they ask $1.90. The Morris Mills Co., who have come to be quite a large factor in the production of cheap balbriggans during the last year or two, are showing a garment at $1.85 made with combed yarn cuffs on which it is said a large business has been placed. From the above quotations it will be seen that last year's prices are being repeated and there are those in the trade who claim these prices are too low to be consistent with good merchandising. They make reference to some balbriggan manufacturers who did not make any money last year, but who seem to be inclined to take further chances.

The better lines of balbriggans are being shown at last year's quotations as well, but it is understood that there is more leeway for a margin on the better end than on the cheap goods.

The Ford Mfg. Co. have a five-pound, 28-gauge line at $3.25. They sell the same fabric with sewed on ribbed border on the shirt for 12 1/2 cents advance, or loop it on for 25 cents. They also substitute pearl buttons on the drawers in place of the horn at $3.37 1/2. These people show a heavier weight line that runs about six pounds to the dozen at $3.75, with looped on ribbed border and pearl buttons.

A. S. Height & Co. offer a five-pound line made of combed yarn or six-pound line made of carded yarn at $3.50. These are made with hemmed border on the shirts and sewed-on anklets on the drawers.

Summer weight ribbed shirts and drawers have not been as popular during the past year or two as in former seasons. Nevertheless, there are several lines in the market and in the aggregate a fairly good business is still being done on them. The Morris Mills continue to make their $1.90 line for 1912, and the Capron Knitting Co. have one as low as $1.85. The Canasawacta Knitting Co. have discontinued making ribbed shirts and drawers and are devoting their entire time to combination suits.

The Blood Knitting Co. are showing a line of ribbed goods at $3.00, weighing from 5 to

5 1/2 pounds, and also show a fine gauge ribbed garment, weighing only about three pounds to the dozen at $3.25. Both of these are made in a line of colors, as well as white and black.

A very considerable increase in the production of men's combination suits to retail at 50 cents is being prepared for, if one may judge from the number of manufacturers who are making them for the coming spring. The Morris Mills are showing one at $3.62 1/2; the Canasawacta Knitting Co. and the Norwich Knitting Co. have lines out at $3.65, and the Avalon Knitwear Co. have one at $3.75. It is understood that the Perry Knitting Co. are offering one as low as $3.57 1/2. All of these are being shown in white and ecru, and a few of the lines in colors as well.

Some very attractive values are being shown in men's combination suits to retail at $1.00 for the coming year. One of the larger Western manufacturers have a line out made on a spring needle machine at $7.00 per dozen, on which it is claimed some large orders have been placed by Chicago and St. Louis jobbers.

Men's lisle thread suits at $9.50 and $10.50 are being bought freely, as well as the mercerized lines at $13.50 to $14.50. These are being taken mostly in white and ecru. The demand for blue and salmon, as well as novi seems to be decreasing to some extent.

The Trustees of the Robert MacKinnon Co. have announced their intention of taking orders for spring lines similar to those formerly made in that mill, and state the Court has consented to grant the right to run the mill to fill all the orders that may be taken.

Business on mesh goods has been somewhat better than was anticipated earlier in the season. The falling off seems to have occurred more on the cheaper lines than on the widely advertised brands. We are informed that the manufacturers of the "Porosknit" lines are spending over $200,000 this year to advertise their production. The capacity of this mill has been increased considerably, and, while they were shut down for two weeks, their yearly production will be much larger than formerly. It is said that a stock of 40,000 dozen that had been made up was depleted during the two weeks the mill was shut down and at this writing orders are coming in faster than they can be filled.

Nainsook underwear for men continues to be very popular as hot weather garments and especially so in the combination suits made with the elastic strip of cloth across the back. For 1912 some attractive looking lines of nainsooks are being offered to the trade that can be retailed for 25 cents for shirts and drawers, and 50 cents for the suits. A 64 by 64 cloth garment may be had as low as $1.77 1/2, or 68 by 72 at $1.87 1/2 for shirts and drawers, and combination suits at $3.62 1/2.

HOSIERY

Hosiery lines for spring, 1912, are open and while opportunity has not been had to carefully look into the same in order to report comprehensively, it is apparent that 1911 prices are to be maintained until a certain amount of business has been booked, at least. A few slight advances are being asked, but mostly on styles that manufacturers do not care especially to make. On such staple styles as are used in large quantities the only change, where one exists, is downward and not upward.

It appears to be decidedly a buyer's market and if the manufacturers will carry out their present avowed intentions of raising their prices when a certain percentage of their production is sold, buyers will do well to get covered now, as it is not likely that any market condition will force prices lower than they are now.

Light weight cotton and lisle hosiery are shown more extensively than ever and they are being constantly made at lower prices.

The objection that has existed for some seasons against the high spliced heel in connection with gauzes has disappeared evidently, for nearly all full fashioned goods are now made with the high heel, and seamless goods to retail at 15 and 25 cents are also to be made in this way. Indications point to their popularity over the low heel for another season, especially in the 25-cent grade.

The three to four inch welt top has become a standard on all light weight goods and is as necessary today on a 15-cent line as on a 50-cent line.

There are some very large quantities of the one-inch welt imported lisles in the market, it is reported, which will inevitably be offered at greatly reduced prices, as buyers will not touch them any more at regular prices.

From all indications early purchases on laces will be very light, as the trade done on these goods by jobbers this season has been very disappointing. A good advance business was done on them, but the immediate business has been far below expectations, with the result that many importers and jobbers are heavily stocked and will carry them over, unless July and August brings life into them.

The silk business has been and is very active and the sales of many jobbers on the low priced grades has been measured only by what they were able to get delivered of them.

The general business on higher priced silks is also increasing, according to reports, and apparently the fear that cheap silks would hurt the sale of better grades is not materializing.

A big volume of business is being done on tan and white, and manufacturers have been rushed with orders calling for immediate delivery.

The backward spring season got into full swing during May and jobbers all over the country, particularly in the West, report the largest business for that month in their history and that it helped to bring them even with the year. June has not been quite as good, owing to the cooler weather that has prevailed, but manufacturers' salesmen report that they find buyers generally ready to place their business now for 1912.

Very low prices are still in vogue on men's half hose and many staple styles can be bought at less money than at any date since Jan. 1, 1911. There is a decided opinion prevailing that fancies are coming back in men's wear and that this fall will see them worn much more gnerally than for some time.

ESTIMATING THE COST OF KNIT COODS

(Continued from June.)

Fig. 4 shows a report of the number of dozens cut each day. By having the waste weighed daily the amount of waste per dozen is determined, thus indicating whether the work is running well or not.

Fig. 5 is the finishing report. These totals are easily obtained by the foreman going around each morning to each of the seamers and finishers and ascertaining from each one the number of dozens done the day previous. He finds out at the same time which girls are the best workers, and if one is not doing as much as she should he is aware of it at once.

April 10 1903

Cutting.

	Dozens Cut Shirts	Dozens Cut Drawers	Waste lbs
Wool	56	34	120
Cotton	42	57	49
Fleece	38	36	80
Totals	136	128	249

John Smith Foreman

FIG. 4.

Fig. 6 shows the form for the report book. In this book the totals with the amount paid out for labor in each department are entered every week, or every two or four weeks as desired.

The pay roll, or time book, should be kept classified with the names of the help in each department, to correspond with the reports, and with this book. This total is entered in the book at the end of each week. Additional columns can be added at the side of each department to receive the totals of the reports. This form will enable the manufacturer who has not already a system of this

kind, to have one printed to suit his own requirements.

To show the calculation of costs we will start at the picker room with a 400 pound batch for mixed goods:

April 10 1903

Finishing Room

Total Doz Seamed		Total Doz Finished		Total Doz Boxed		Total Doz Shipped	
S	D	S	D	S	D	S	D
78	70	60	75	80	75	100	100

John Smith Foreman

FIG. 5

300 lbs. wool at 18c. $54.00
75 lbs. cotton at 9c. 6.75
25 lbs. shoddy or waste at 5c. .. 1.25
6 qts. oil at 20c gal. ..... .30

$62.30

$62.30 divided by 400 gives 15 58/100 cents, cost per pound of the raw stock.

PICKER ROOM

2 men at $1.25 per day $2.50

CARDING ROOM

"Boss" carder, per day $2.50
Second hand, per day 1.50
2 cleaners at $1.00 per day 2.00
6 boys at $2.50 per week 2.50

Per day $11.00

These operatives are about what would be required in a six-set mill.

Average daily amount of stock put through the pickers and cards, say 2,000 pounds.

$11.00 the total amount of wages per day, divided by 2,000, gives 55/100 cents as the labor cost per pound of stock for picking and carding.

SPINNING ROOM

Spinning is usually by the piece. We therefore take the price per pound, which for 30 grain yarn would be about 50 cents cents per 100 pounds, or 1/2 cent per pound, and add to this the cost for the overseer and his help.

The 400 pounds of raw stock from the card room has lost say about 10 per cent. the waste going back into another batch. In calculating the spinning cost we deduct 10 per cent. from the card room daily production, which gives 1,800 pounds.

"Boss" spinner $2.50
2 boys at $5.00 per week 1.63

Per day $4.13

Form of Book for Entering Daily Reports.

Date 1903	Picking Room					Daily Cards	Total Picks	Spinning				Total Yarn	Spinning				Total Yarn	Coal	Repairs	Oil	Engineer	Remarks
April	10	942	220	420	210	375		200	200	200	1845		134	138	200			105	135	125	200						
"	11																										
"	12																										
"	13																										
"	14																										
"	15																										
Total							$24.00																				

FIG. 6.

Average daily production, 1,800 pounds of yarn.

Dividing $4.13 by 1,800 gives $23 per hundred pounds, to which is added the 50 cents for spinning, bringing the labor cost for spinning to 73 cents per hundred pounds.

WINDING AND KNITTING

The winders are paid by the pound. For

30 grain yarn the price would be about 25 cents per 100 pounds or 1/4 cent per pound. Knitters are paid by the pound in some mills, and in others work by the day. In the former case the cost can be figured as for spinning; in the latter case, as for carding.

Add together the daily wages of all the help and divide by the average daily number of pounds of cloth knit. By taking the number of pounds of cloth required for one dozen goods, including the waste in cutting, the cost per dozen for knitting is obtained.

The number of pounds of cloth will be less than the pounds of yarn, as about 1 per cent. will be waste in winding and knitting. This gives 1,782 pounds cloth.

"Boss" knitter	$3.50
4 girls at $1.00 per day	4.00
1 helper at	1.00
1 boy at per week	.82
Per day	$9.32

Dividing $9.32 by 1,782 pounds gives 52 cents, cost per pound for knitting.

In addition to these labor costs, there is added the cost for repairs, such as belting, lace leather, ropes, etc., in picking, carding and spinning rooms, and for needles and needle metal in the knitting room.

All mills shuld keep a separate account in their ledgers for "Repairs" and "Expense" to which everything that is used is charged. Dividing the amount either by the number of pounds of cloth made will give the cost per pound. Dividing by the number of dozens of goods finished gives the cost per dozen.

The cost per dozen for washing, scouring, drying and boarding can be ascertained in the same manner. The average cost of materials used should be added.

FINISHING ROOM

Nearly everything in a finishing room is piece work, and costs very little on different styles. By adding the cost totals for all the finishing operations and including the cost of the day help, the total labor cost of finishing is obtained.

The fixed expenses of the mill do not decrease if the production is decreased, but remain the same. These include the salaries of manager, superintendent and office help, wages of engineer and watchman and cost of insurance, coal, etc.

The average cost per dozen for these fixed expenses is based upon the average daily, monthly, or yearly production of the mill, as already shown.

A NEW DOGLESS ATTACHMENT FOR WILDMAN RIBBERS

One of the objectionable features of circular latch needle rib knitting machinery is the dog or lug on the cylinder and dial, which transmits through the fabric the pressure necessary to hold the dial needles in position midway between the cylinder needles. The operation of this lug depends on the thickness of a yielding medium, the cloth. Consequently, one of the important adjustments, the relative spacing of the two sets of needles, changes with any change in the pressure between the lugs—as when the machine starts, stops or changes speed—and changes with any difference in the thickness of the cloth, as when the welt or tuck portion passes between the lugs, or when the yarn or stitch is changed.

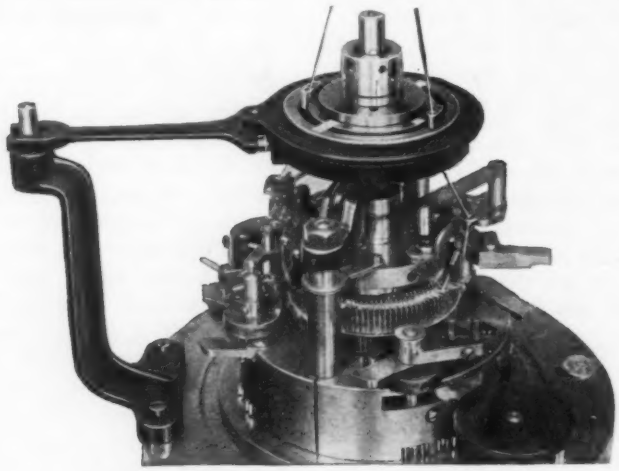
This variability of the relation between the two sets of needles is not the only objection to the dogs. They press a streak along the length of the fabric; they hold back the cloth immediately above the dogs, inviting a lead-up, due to insufficient tension; they catch bunches; they tear holes larger, and they get in the way of the operator when "hooking-up." The last named objection becomes more apparent as the size of the machine decreases, and is responsible for many broken needles. The other objections are also more serious on small sizes, even if not noticeably so.

The Wildman Mfg. Co., of Norristown, Pa., are now presenting to the trade a device for small sized machines, which does away with the objections to the dogs, except the insignificant one of a slightly increased initial cost. This device, called the dogless attachment, is shown in the accompanying illustra-

tion, in position on a two-feed automatic ribber. The object is to do away with dogs entirely. This necessitates controlling the dial from without the machine, which is done by holding the center stud stationary. The problem then is how to keep the stud from revolving and yet permit the yarn to revolve around the stud. This is accomplished by providing in the holding device, a circular channel in which the yarn travels, properly guided, and which channel is bridged by four bolts, which successively withdraw to allow the passage of the yarn and return to lock the two sides of the channel. Two bolts are always in the locked position. On the right of the stud, the yarn is shown entering and leaving one guide, which has just passed a bolt. The latter is about to shoot across the channel. The two bolts bridging the channel are clearly seen. The fourth bolt cannot be seen since it is behind the guide at the left of the stud.

The circular adjustment of the dial is effected by means of two screws; one of which is seen near the pin which connects the arm with the ring of the attachment. With the lugs, the adjustment was not a successive one. Once the binding screw was loosened, the old adjustment might be lost entirely. Moreover, the adjustment was a matter of experiment, since the cloth had to be put in position before the correctness of the adjustment could be proved.

The adjustment of the dogless attachment is positive and accurate. It is controlled by a micrometer. There are two screws easily accessible, so that the final adjustment may be securely locked. The result of the adjustment is instantly evident, and it is entirely independent of the fabric or of any other outside influence. The dogless attachment is supplied at a small extra cost on new Wildman ribbers up to 9 inches in diameter, when specially ordered.



THE WILDMAN DOGLESS ATTACHMENT FOR RIBBERS.

APPLYING TRADE-MARK STAMPS TO HOSIERY

The following simple directions are given by the Meyercord Co., Inc., of Chicago and Philadelphia, for applying the Meyercord gold stamps. Although a special iron is not necessary, the handy iron designed for this purpose by H. A. Meyercord, Bulletin Bldg., Philadelphia, is usually employed on account of its adaptability to the work. By following these directions, the operator's results vary according to his efficiency and skill from 180 to 250 dozen pairs of hose per day.

Cut into single stamps, as they are delivered in sheets for convenient handling.

Use a transfer felt pad, 12 by 12 inches,

about 1/4 inch thick, which is soaked with water, all it will retain.

Lay the cut stamps face down on the wet felt, as many as the pad will hold, then wet the back of the stamps thoroughly.

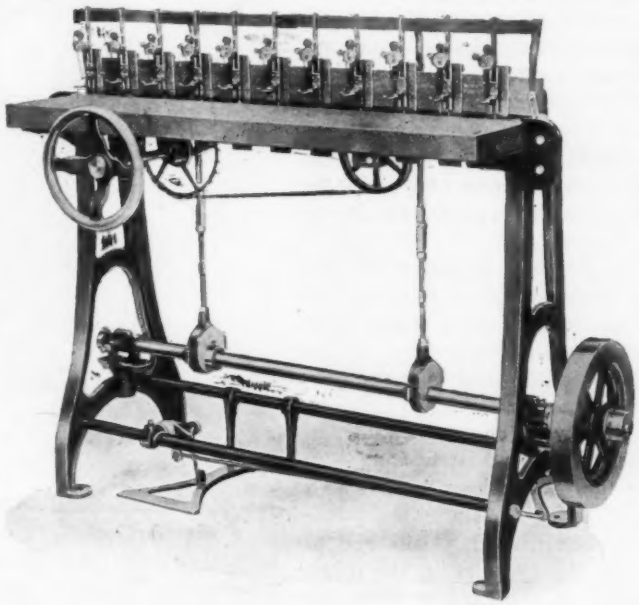
Lay the hosiery in piles of a dozen; place the gold stamps on hose with as little shifting as possible.

Press down the hot iron with a slight sliding motion for an instant only.

Lift off paper and turn back hose, and repeat same operation on each successive pair.

THE FIRSCHING MARKING MACHINE

This new machine is built by J. A. Firsching, 16 John St., Utica, N. Y., for marking buttons and button holes on shirts, drawers and union suits. The marking for both buttons and button holes can be done in one operation, or they can be marked separately, if desired. If, as is generally the case in union suits, the trunk measurements vary in length, the machine divides the difference equally between each button and button hole. Frequently the stay is longer or shorter than the facing. In such cases the machine divides up the difference equally between each button and button hole. When the garment is buttoned up it is impossible to discover that the stay and facing are not of the same length, as the buttons and button holes at the top and bottom come where they belong and the others are equally spaced. A trunk measurement may be 30 inches on one garment and 31, 32, 26 or 28 inches on the next. This variation, however, does not interfere with the working of the Firsching machine, which divides the distance equally so that the spacing between buttons is the same in every case. Every underwear manufacturer knows that the proper location of the buttons and button holes has an important bearing on the fit of the garment. Previous to the invention of the Firsching machine it was not only difficult but expensive to do this work properly. With the machine, however, the cost of marking is reduced to a very small sum and the work is done perfectly. Mr. Firsching asks manufacturers to go into their stock rooms, open a few boxes of goods and examine the buttons and button holes to see how they are spaced and



THE FIRSCHING MARKING MACHINE

whether they are in the right place at the bottom of the garment so that the gusset will hang properly. He is confident that the irregularity of the spacing will surprise most manufacturers and he invites them to correspond with him in regard to the Firsching machine.

OPEN-WORK DEVICE FOR KNITTING MACHINES

A German device for producing open-work patterns on knitting machines, recently patented in the United States, is described by the inventors as follows: Straight bar knitting machines for the manufacture of open-work or lace goods, are in some cases furnished with jacquard apparatus for the formation of the pattern. The pattern is plotted on a pattern card in the form of perforations, and this card travels intermittently under a number of jacquard needles.

Each jacquard needle is connected with a particular lace point in each division of the knitting machine, so that one and the same pattern is simultaneously produced in all divisions.

Fig. 1 shows a stocking leg, of which the part marked by cross-hatchings is to receive an open-work pattern, the other parts being plain. Fig. 2 is a cross section of part of the jacquard apparatus used, producing the pattern shown or indicated in Fig. 1. Figs. 3 and 4 are respectively an elevation and plan view of the other form of construction.

Fig. 2 shows the card prism, 1, on which hangs the pattern card, 2. Above the prism there is another pattern card, 3, one end of which is coiled on the cylinder, 4, the other end on the cylinder, 5, the card, 3, being attached to the cylinders by screws, 6 and 7. The cylinders, 4, 5, are rotatable and carried by arms, 8 and 9, fixed to a plate, 10. To the cylinder, 5, is fixed a ratchet wheel, 11, engaged by a pawl, 12, which can be reciprocated in the directions indicated by the arrows, 13, 14. The mechanism for moving this pawl may be of any suitable kind and is not shown in the drawing. Another pawl, 15, prevents rotation of the cylinder, 5, in the direction of the arrow, 14. To one end of the cylinder, 4, there is fixed a disk, 16, with a cord, 17, attached to it, and a weight, 18, fastened to this cord keeps the pattern card, 3, stretched.

The jacquard needles, 20, are arranged in the ordinary manner, each needle being independently vertically movable in a plate, 10, but normally held down either by its own weight or by a spring. There are as many

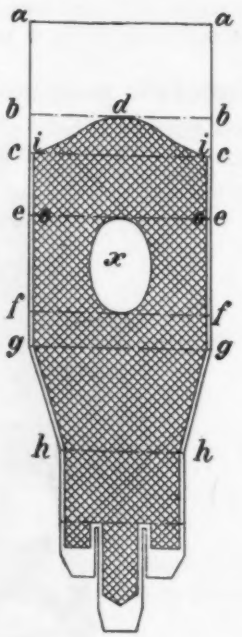


FIG. 1.

jacquard needles, 20, as there are lace points in a division of the knitting machine, and each lace point in a division is connected to a particular jacquard needle, 20. To one of the jacquard needles, 20, a cord, 22, is attached at, 21, and passes over a pin, 23, to a lug, 24, of the lace point, 25. The lace point, 25, acts in the known manner to cover the hook of the frame needle, 26, so that the loop on the frame needle, 26, passes on to the needle, 25, to be transferred by the latter to the next frame needle. When the jacquard needle, 20, is pulling the cord, 22, either by gravity or by the action of a spring, the lace point, 25, covers the hook of the

frame needle, 26, and then the transfer of the loop to another needle can take place. If, however, the cord, 22, is slack, the lace point, 25, is by its own elasticity, held back and does not come into action.

The card prism, 1, and both the card cylinders, 4, 5, are caused by mechanism not shown in the drawing, to move up and down. At each upward movement the card, 3, strikes the lower end of the needles, 20, in its path and the said needles are thus lifted. Such needles, 20, as are in line with holes in the cards are not lifted, and remain suspended from the cord, 22. For such lace points, 25, as are, at the proper time, to

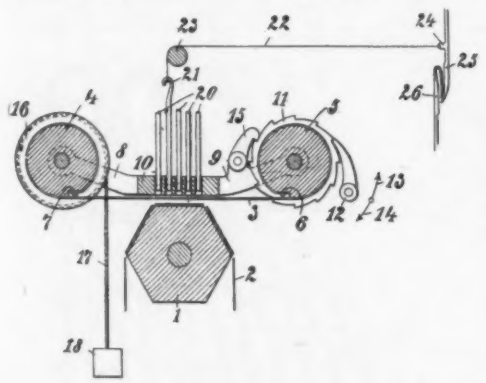


FIG. 2.

cover the hooks of the frame needles, 26, the respective jacquard needles, 20, must encounter holes in the cards, 2 and 3. The holes in the card, 2, are so arranged as to produce a certain open-work design at each rotation of the prism, 1.

In the card, 3, there may be holes for all the needles, 20; in this case the card, 3, has no effect on the action of the machine. Or there may be no holes at all in the card, 3; in this case the formation of an open-work pattern is prevented, and plain fabric is produced. Finally, there may be holes in some parts of the card, 3, and not in others; in this third case only such holes in the card, 2, will produce an effect as will coincide with holes in the card, 3.

The arrangement described affords important advantages which may be explained with reference to the manufacture of a stocking leg as shown in Fig. 1. During the whole course of manufacturing the stocking leg, from the upper end, a—a, to the lower point of the foot, the pattern card, 2, of the jacquard apparatus continues in operation. The covering card, 3, remains, however, stationary during the knitting of the part between a—a to b—b. That part of the covering card, 3, which is at this stage to lie under the needles, 20, has no holes, so that none of the needles, 20, are allowed to drop in order to be acted on the pattern card, 2. The part a—a b—b of the fabric therefore remains without pattern, i. e., is plain. At the moment at which the row of loops, b—b, is knitted, the pawl, 12, begins to move the covering card, 3. The movement of the card, 3, continues until the row of loops, c—c, is reached, and for each new row of loops produced during the movement a larger number of holes is placed under the needles, 20. The effect of this is that two substantially triangular pieces of plain fabric, b c d, are produced, simultaneously with a substantially triangular or segmental part, c d e, with a pattern. During the knitting from c c to e e, the covering card, 3, again remains stationary, the part under the needles having holes for all the needles with the exception of those which produce the narrow edge strips, c i, c e. These narrow strips are made plain to facilitate the sewing together of the edges.

From the row of loops, e e, to the row, f f, the covering card, 3, is moved so as to place under certain needles, 20, a non-perforated part of elliptical outline, so that a plain elliptical piece of fabric, x, is knitted within the pattern. Narrow lateral strips are also unperforated, to continue the plain edges of the fabric. From f—f to g—g the card, 3, remains stationary, presenting to the needles a part which is perforated for all the needles except those at the edges. From g—g to h—h, narrowing takes place, and the card, 3, must be moved at each reduction of the width, in order that the plain edges may continue. This description of the action will be sufficient to indicate the manner in which the leg is finished. It will be seen that the in-

vention enables goods of any shape and pattern to be produced with the aid of cards of minimum size.

A KNITTED FABRIC

This is a fabric made with a combination of a ribbed and a plain web, the latter having a smaller number of wales than the ribbed web. This change is accomplished by doubling some or all of the rib wales into wales of the plain web. In describing the fabric Robert W. Scott, the inventor, states that hitherto the change from one type of web to the other has been effected by laterally displacing a stitch of each wale which is to be doubled and interknitting the displaced stitch of the adjoining standing wale. This method is objectionable because a laterally displaced stitch does not present itself in the best position for the entrance of the needle to which it is to be transferred.

The object of the present invention has therefore been to overcome this objection in effecting such doubling transfers and at the same time to make a less abrupt change in the width of the web at the point where the wider web joins the narrower web.

Fig. 1 is an exaggerated view of a piece of web in which a change is effected from two-and-two ribbed web to plain web having a lesser number of wales; Fig. 2 is an exaggerated view of a piece of web in which change is effected from a one-and-one ribbed web to plain web having a lesser number of wales; Figs. 3, 4 and 5 are diagrammatic representations of the different dispositions of the needles resorted to in knitting the web shown in Fig. 1, and Figs. 6, 7 and 8 are diagrammatic representations of the different dispositions of the needles resorted to in knitting the web shown in Fig. 2.

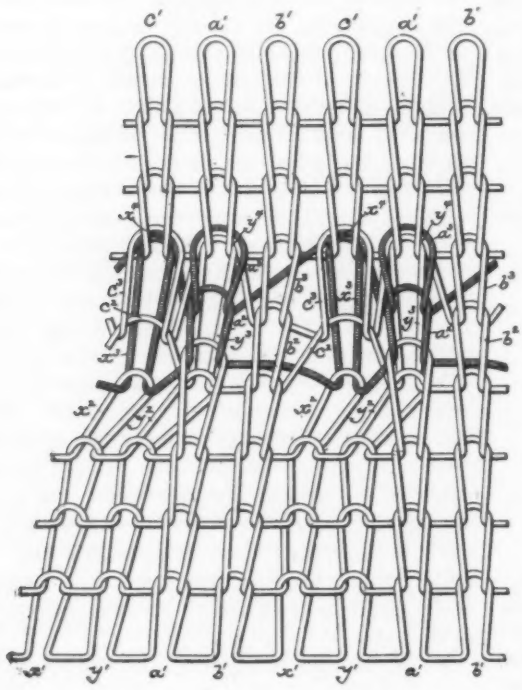


FIG. 1.

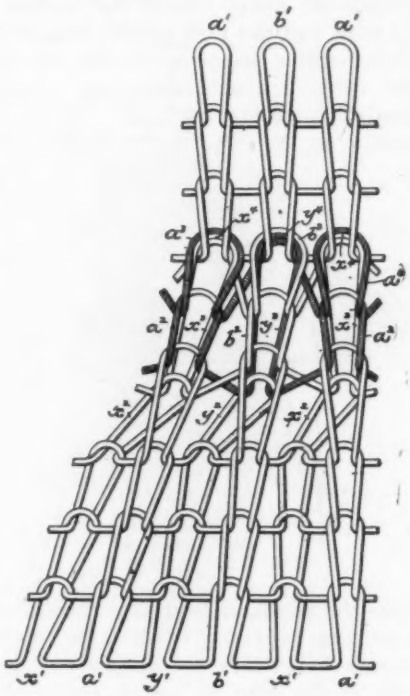


FIG. 2

The invention can be practiced upon any type of rib knitting machine provided with means for shogging the needles of one set in respect to those of the other set so as to cause the needles of the two sets to as-

sume, at different times, different relations to one another, and also provided with means for transferring stitches from needles of one set to needles of the other set, and with means for independent control of the needles in the manner hereinafter set forth.

Usually the fabric is knit on a circular rib

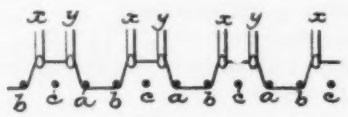


FIG. 3

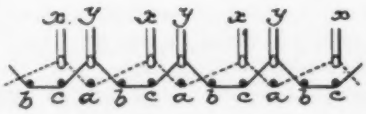


FIG. 4

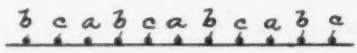


FIG. 5.

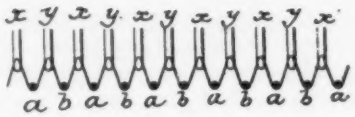


FIG. 6.

FIG. 7.

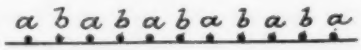


FIG. 8.

knitting machine having the needles for producing plain web contained in the cylinder and the ribbing needles contained in the dial. In this fabric it is not the shogged stitch which is interknitted with the standing wale, but a subsequently produced stitch, the object being to permit the stitch which is actually transferred to be drawn out straight over the receiving needle instead of being pulled diagonally across the same, as it must be when the transferred stitch is the shogged stitch.

One or more, and preferably a plurality, of stitches are formed upon the shogged dial needles while the same occupy their new relation to the cylinder needles and before effecting the transfer of the stitches from the dial needles to the cylinder needles. In effecting the transfer the dial needles are preferably projected to such an extent as to draw into line with the receiving needles the stitches of the course preceding that actually carried by said dial needles, both the preceding stitches and those cast from the dial needles being caught by the receiving cylinder needles when the dial needles are retired, this having been found in practice to be the best method of effecting the transfer, although it is not necessary to resort to this method, as but one course of ribbed web may be formed upon the needles when they occupy their new relations, the stitches upon the dial needles being transferred to the receiving cylinder needles. In either case the stitch to be transferred will, on the projection of the dial needle be drawn out directly over the receiving cylinder needle, there being no tendency to lateral deflection of said transferred stitch, because the stitches upon the cylinder needles on each side of the dial needle exercise substantially the same degree of lateral pull upon the dial needle stitch.

The annual report of the Bradford Conditioning House states that the weight of tops, wool, yarns, etc., which passed the house for testing purposes during 1910 was 97,465,336 lbs., as compared with 91,075,568 lbs. for 1909 and 76,899,890 lbs. for 1908. The number of tests made during 1910 was 235,417, as compared with 213,582 in 1909 and 179,943 in 1908. The fees received were £24,162, as compared with £20,991 in 1909 and £16,661 in 1908. As compared with Bradford's total of 97,465,336 lbs., at Tourcoing 113,480,964 lbs. were dealt with and at Roubaix 109,009,736 lbs. For wool alone the Bradford figures are 97,300,782 lbs., as compared with 102,912,852 lbs. at Tourcoing and 96,150,094 lbs. for Roubaix.

Dyeing, Bleaching, Finishing, Etc.

THE AFTER TREATMENT OF SUBSTANTIVE DYES ON COTTON

BY THOMAS FORSYTH

Winner of the Textile World Record Gold Medal at the Philadelphia Textile School

Taken as a class, the substantive dyestuffs are lacking considerably in fastness in various respects. This shortcoming has been the cause of exhaustive research on the part of dyers and chemists. The sulphur colors, vat colors and aniline black are extensively used on cotton goods in preference to dyestuffs of the substantive class, because of their superior fastness, but there are many reasons why the direct colors cannot be entirely replaced at the present time. The main points in favor of the substantive dyestuffs may be enumerated as follows:

THOMAS FORSY H.

Simplicity and low cost of the dyeing operation.

Fastness (usually) to perspiration.

Fastness to hot pressing.

Good penetration.

Softness and luster of the dyed material.

Freedom from odor.

The great variety of shades available.

They may be padded instead of dyed.

They are, however, usually rather lacking in regard to fastness to light and washing, many of them, indeed, being very fugitive in one or both of these respects.

A partial solution of the difficulty was arrived at by the introduction of certain substantive dyestuffs containing an amido group, capable of being diazotized and developed, thus, in many cases, not only increasing the fastness of the dyeings, but also giving a substantial increase in depth of shade. However, this method did not solve the problem entirely, as the variety of shades obtainable in this manner is not sufficient to meet the requirements of the trade.

Other methods, making use of such substances as formaldehyde, diazotized paranitraniline, solidogen, etc., have been devised and proved successful in certain cases, but these will not be considered here. Attempts were made to dye with direct colors on goods mordanted with chrome and other metallic salts, but the results were not entirely satisfactory. For instance, Diamine Fast Red F, when dyed on chrome mordanted cotton, is somewhat faster to light, but as to washing and bleeding into white, it is not bettered to any noticeable extent.

Better results are obtained by an after treatment of the dyed material with a solution of a suitable metallic salt under proper conditions.

This method of fixing the direct cotton colors has been patented by the Farbenfabriken Co., who apply it to their Benzo Azurine. The patent is the outcome of the observation that certain color derivatives of

the diamido-diphenol ethers, such as Benzo Azurine G and 3 G, Heliotrope, etc., can be fixed so as to be fast to washing, by an after treatment with salts of copper, zinc or nickel.

An English patent granted to the Farbwerke vorm Meister, Lucius and Bruning, then revealed the applicability of the above process extended to the use of chromium compounds, to a larger range of colors which contain salicylic, ortho and meta cresotinic, oxynaphtoic and 1/8 dioxynaphthaline mono and di sulphonic acid. It was noted that all the salts of chromium oxid were applicable as fixing agents, but it is said that the basic chlorid of chromium is especially adapted for the purpose.

The use of salts of nickel and cobalt in making certain substantive colors fast to light has been patented by Aykroyd & Krais, the claim being made for this process that, although copper salts are more active as far as fastening to light is concerned, than either nickel or cobalt, the latter are desirable in that they do not cause the changes in shade that copper salts almost invariably do. This is an important point in favor of the use of these metals, but their general use is prohibited by their high price in comparison with the cost of copper sulphate.

The question of cost is one that must be considered in the use of any metallic salt for purposes of after treatment, and thus the number of compounds available for the purpose is made comparatively small. Salts of nickel, cobalt, zinc and the rare metals are too costly and the results obtained by the use of iron, manganese and lead are of little value, so it is seen that the salts of copper, chromium and aluminum are about the only ones that give results that are satisfactory and at the same time are not prohibitive in price. The compounds of these metals are extensively used for the fastening of substantive dyeings.

These metals do not act the same on all substantive dyestuffs and the different metals have dissimilar action on the same dyestuff. Salts of copper are generally used to increase the fastness to light, while chromium and aluminium salts are applied to improve the washing qualities of the dyed goods. In some cases one of these metals may assist in the fastening to both light and washing, but in general this is not the case.

Owing to the fact that the dyestuffs are very complex bodies and that their chemical properties are often known very little or not at all, it cannot be foretold with any degree of certainty whether treatment with a certain metallic salt will increase the fastness of a given dyestuff. In fact, many of the substantive dyestuffs, even some of the most common ones, are of unknown constitution, and therefore in order to determine the effect of metallic salts on the fastness of the color, practical tests must be resorted to. In carrying out such tests, the condition of the bath as to temperature, dilution, acidity, etc., must be carefully noted, as these points have considerable bearing on the success of the operation.

The salts of the different metals will now be considered separately in regard to their application and the results obtainable by their proper use.

SALTS OF COPPER

Of all the salts of copper, the sulphate is found to be the most adaptable on account of its low cost, ready solubility, uniformity and stability. Depending on the depth of shade, the amount of copper sulphate recommended for after treating varies from 1 to 5 per cent. on the weight of the goods. For pale shades, 1 per cent. should be sufficient, while heavy shades generally require about 4 per cent., but for any ordinary dyeings of medium depth, 3 per cent. is the amount usually recommended to give the best results.

The operation may be conducted either hot or cold. If done cold, the fastening to light is increased, but the washing qualities of the dyed material are not increased. If the operation is carried out at a higher temperature, an increase in fastness to washing is noticed with some colors. This is most pronounced when the after-treating bath is heated to the boiling point, but the high temperature has an injurious effect on the shade

in most cases, which is better avoided, as, should the effect be very noticeable, a topping off with basic or substantive dyestuffs may be required, or the dyeing may be permanently ruined. The topping with basic dyes may be done in the copper sulphate bath when the effect of the salt is known beforehand. After such an operation, the material is simply rinsed and finished.

In view of the detrimental action of copper salts on the color when applied at the boil, a more moderate temperature is advisable, from 140° to 180° F. being the best in most cases. A somewhat longer treatment is required at 140° F. to give the desired fastening effect, but the material is left in a better condition and the shades are less affected. The time of treatment should be from 20 to 30 minutes.

The best results are obtained on the jigger by using 1/4 to 1/2 ounce of copper sulphate for each gallon of water. The bath is heated to about 170° F., and the pieces are given two ends, one-half of the copper salt being added at the start of each end.

Although copper sulphate itself has a slightly acid reaction, the presence of the material to be after treated is apt to cause the decomposition of the salt, which can be detected by the cloudy appearance of the bath. To prevent this, acetic or sulphuric is added to the bath. Acetic acid is preferable because of the danger always attending the use of sulphuric acid on cotton material. Furthermore, certain substantive dyestuffs are more or less affected by the stronger acid. It is customary to use about as much acetic acid as copper sulphate. If sulphuric is used, a somewhat smaller amount will be sufficient.

Very often soda ash is used in the dye bath and if not entirely washed out it will prevent the proper action of the copper salt in the subsequent after treatment. Care must, therefore, be taken to free the material of any alkaline reaction before entering into the after treating bath. A trace of acetic acid in the rinse water will readily overcome this difficulty. Should it be found necessary or desirable to top the after treated goods with a substantive color, no soda-ash should be used in the topping bath on account of its action on the copper sulphate. Only Glauber's salt should be used in conjunction with the dyestuff. After topping, rinse well, but no further after treatment will be necessary.

The use of copper compounds is not confined to the fastening of colors as described above, but they may be made to serve other purposes as well. The formation of copper soaps, copper casein, copper albumen, copper tannate and copper ferrocyanide on the fiber after dyeing not only increases the fastness to light, but serves as a waterproofing process and prevents the formation of mould. These properties are not usually very permanent, but if the following formula is used, the results obtained are quite permanent and of considerable value:

Five to ten pounds of gelatin in three galgons of water, one to two pounds of chrome in two gallons of water. Make up to six to ten gallons, according to the amounts taken, and work the whole to a clear solution. If the gelatin shows signs of settling out, a little acetic acid is added. The cloth, which has already been padded with a copper solution, is then padded with the above at 76° F. Dry at not over 122° F., and expose each side of the goods to the sun for several hours.

A method by which copper may be applied so as to affect the shade but little is to treat the dyed material with a 1 to 2 per cent. solution of cupric oxide of ammonia. The general effects thus obtained are the same as those resulting from the use of copper sulphate, the only drawback being the much lower cost and greater convenience of the use of the sulphate.

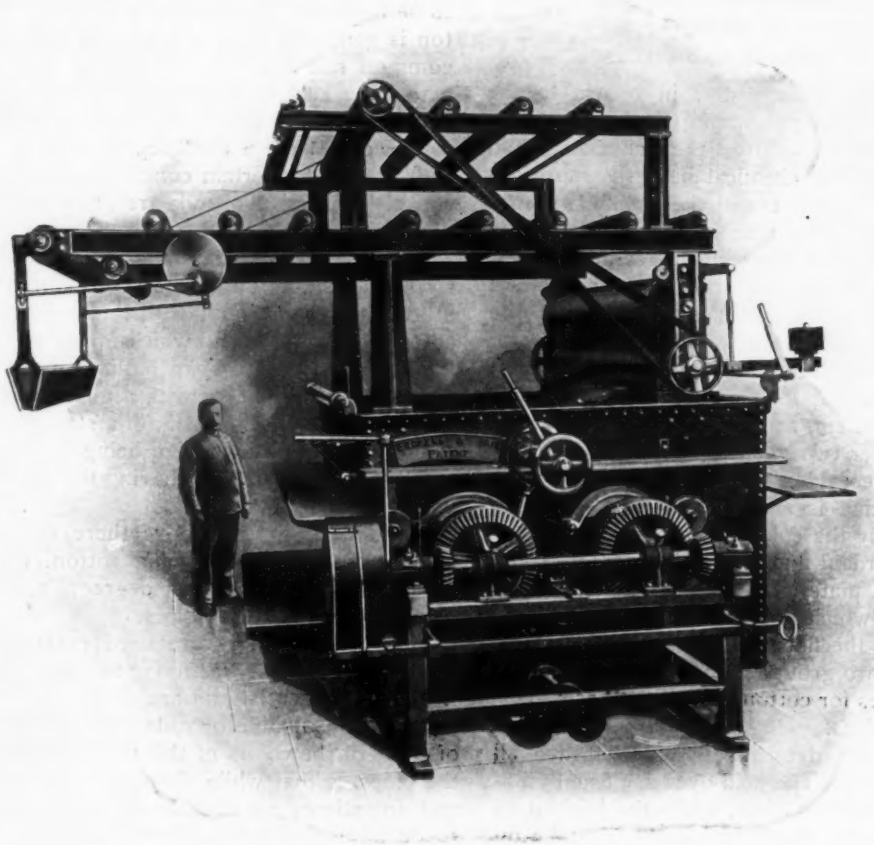
An objection often made to the use of copper salts in after treating is that this metal causes changes in shade, thereby making the matching more difficult, but this is soon overcome by practice. The shades are nearly always changed, but the change never varies, and by determining the extent of the alteration in shade before hand, exact

matches can be made previous to the copper treatment.

(To be continued.)

AN INDIGO DYEING MACHINE FOR PIECE GOODS

The machine shown in the accompanying illustration is built by Erckens & Brix, Rheydt, Germany, for whom L. H. A. Schwartz & Co., 53 State St., Boston, Mass., are the sole American agents. It has a large wrought iron vat in which the liquor is held at a uniform strength, preventing the hydrosulphite from being exhausted too quickly. The cloth is automatically wound from one roller to the other during the dyeing process and is kept submerged in the liquor, without any assistance from the workman. The end of the piece being dyed is fastened to a short linen leader of which the other end is attached to the roller. The winding and reversing of the rollers are both automatic. When the dyeing process is finished the cloth is passed through the squeeze rolls and carried to the oxidizing frame above the vat. The press rollers are of iron, the upper one being covered with rubber. The take-up rollers are also of iron and very strongly built. The rollers in the oxidation frame are of wood with an iron shaft passing through from one end to the other. This machine is in successful use in a number of German mills and dye houses. A thorough impregnation of the goods is obtained and



AN INDIGO DYEING MACHINE FOR PIECE GOODS

the machine is thus specially adapted for heavy goods. The pieces are colored evenly and there is no possibility of damage owing to the cloth coming in contact with the air during the dyeing process.

Further information concerning this dyeing machine can be obtained from the American importer.

PRACTICAL DYEING

BY RENMARK

DYESTUFFS AND FIBERS

Scientists differ widely in regard to the theory of dyeing. Among the generally accepted theories are the chemical and mechanical, the chemical have the more adherents. Supporters of the chemical theory claim a chemical combination of the colors and the fiber or some substance in the fiber, while the others claim there is a mechanical absorption of the particles of dyestuff by the intermolecular spaces of the fiber.

There are many ways of dividing the different coloring matters, the simplest being to group them, according to the fiber to be dyed, under two general headings:

1. Direct dyes, those which dye the fiber directly, that is in one operation which requires only the color and material.

2. Mordant dyes, which in addition to the color and material necessitate the use of a mordant, which has an affinity for both the color and the fiber.

These two groups may be subdivided into: Direct dyes for cotton; acid dyes; basic dyes; alizarine dyes.

The direct dyes for cotton will dye all cotton fibers. The acid dyes are usually applied to wool and silk, while the basic dyes have a direct affinity for wool. To take up the basic colors cotton must first go through an operation called mordanting which mordant is generally sumac, or tannic acid and antimony. The alizarine colors are used chiefly for wool and before applying same the wool is mordanted usually with bichromate of potash and cream of tartar. This last mentioned group are the fastest to light and washing.

Another class of colors which find limited application in dyeing are the pigments such as lamp black, ultramarine and vermilion. A number of the laundry blues are made of ultramarine; the others being made from Prussian blue or soluble aniline blue. Lamp black is used for making certain inks, and in paper dyeing and printing, while vermilion finds practical application as a paint.

Dyeing takes place in neutral, acid and alkaline solutions according to the material to be dyed and the dyestuff employed. Cotton is generally dyed in a neutral bath with common salt and wool in neutral and acid baths, the acid used being acetic, sulphuric and formic. An acid is not used on cotton as it would have a tendency to weaken the fiber and under certain conditions destroy it entirely. Alkalis like soda are never put in a dye-bath with wool, the reason being that soda causes wool to assume a harsh undesirable condition. Silk is, as a rule, dyed in a boiled-off soap liquor with the addition of acetic or sulphuric acid which forms what is known as a broken soap bath. Silk in its natural state is covered with a gum which is removed by boiling the silk in a strong soap solution, the resultant liquor being a mixture of silk gum and soap and having the name of boiled off soap liquor.

In addition to the above there are two groups of colors, for dyeing cotton, which possess fastness to a great degree: 1. Sulphur colors. 2. Vat colors.

The sulphur colors are used extensively where exceptional fastness to light and washing is essential and are dyed under the addition of sulphide of soda. A peculiarity of some of the colors of this class, especially the blues, is that while showing a dull color and sometimes an absence of any definite shade when first coming from the dye-bath, the action of the air rapidly brings out the shade. To develop the color completely, it is necessary in some instances to let the material lie covered in a hot wet state for an hour or longer. This operation is known as smothering.

The vat colors known under the trade names as Algol Ciba, Indantrene, Helindone and Thio Indigo are the fastest of all colors that can be applied to the cotton fibre. A

great number of them are fast to chloride of lime or in other words will stand a bleaching test without being affected. These vat colors which are dyed like indigo with hydrosulphite of soda and caustic soda, would find a larger field if it were not for the fact that they are expensive to use.

Temperature is a very important point in dyeing. It must be carefully regulated in order to obtain correct results. Generally dyestuffs have a greater affinity for the fiber in a hot liquor than a cold one.

In dyeing a piece of material composed of cotton and wool it can be made to assume different effects by simply varying the temperature. For instance if put in a bath containing a certain black, by keeping the heat around 120° F. or lower, cotton becomes black while the wool remains almost white. By raising the temperature to the boiling point both the cotton and wool are dyed black. Thus it is obvious that in the same dye bath there can be produced a black and white effect or a solid black by regulating the temperature.

Temperature may also cause destructive results as for instance with auramine, a basic yellow, which when dyed warm yields a beautiful clear yellow but if boiled it becomes a weak dull useless shade.

Sometimes in dyeing mixed fabrics, cotton and wool for instance, several dyestuffs possessing different chemical properties are dissolved together to produce two colored effects. A green with a special affinity for wool and a red applicable to cotton only are put into the same dye-bath, the material is immersed and after remaining for a certain time at the required temperature it is taken out, the result being a red and green effect, the cotton being red and the wool green. As red and green would produce naturally a dark blue, it is natural to suppose that the resultant color would be a dark blue, but as previously stated some colors have a marked affinity for certain fibers and it is only by an understanding of the proper selection and method that the desired results are obtained.

While various effects can be produced on goods composed of fibers having different chemical formation, such as cotton and wool, wool and silk, etc., it is also practical to treat a fiber in such a way as to cause it to have more or less affinity for coloring matter than the same fiber has when not treated. Examples of this are bleached and unbleached cotton, plain and mercerized cotton, ordinary wool and resist wool.

A very important factor in dyeing and one which many do not consider is the quality of the water used. If it contains much iron or sulphur, it is very unsuitable for dyeing and has to be corrected by chemical teatment or by filtration.

Iron will spoil many colors, causing some reds to become very dull, blues to assume a brownish cast, while sulphur being a powerful bleaching agent will competely destroy many colors. Most dye vats are made of wood, although many iron and copper ones are in use; the iron being very suitable for the dyeing of sulphur colors. Copper affects many colors, changing some yellows to orange, scarlets to dull bluish reds, while some blacks produce a brown instead of a black in the presence of copper.

The amount of water has also to be taken into consideration and varies according to the material and the method or the machine employed, as well as whether the material is in the raw state, yarn or in the piece. Wool requires about fifty times as much water as material, by weight. Thus 100 pounds of wool requires 625 gallons (5208 lbs.) of water. Cotton requires a smaller proportion of water than wool, about 20 to 1, which means that for 100 pounds of cotton 250 gallons (2083 lbs.) of water is used. There are many methods of dyeing in which these figures are greatly reduced. In the case of cotton the proportion goes as low as 70 gallons (583 lbs.) of water for 100 pounds of material and even less than this.

Wool absorbs nearly all the color from the dye-bath, in consequence of which the liquor is run off after dyeing. Cotton, however, generally leaves a lot of useful color behind after the dyeing is completed, and in many dyehouses this bath is saved and used again after the addition of fresh color, thereby saving considerable money. As an instance of this saving it may be mentioned that in

making up the first bath 10 pounds of color are necessary, while subsequent bath will produce the same shade and strength by the addition of 6 pounds of color to the old liquor. This is known as a standing bath.

(To be continued.)

TESTING THE ACTION OF LIGHT UPON DYED SHADES

BY KURT GEBHARD

From the Journal of the Society of Dyers and Colorists

(Continued from April)

The acid and alkali contents of the air can on no account be neglected, for, as has already been pointed out, they play a great part in autoxidation phenomena. To what false conclusions exposure under unknown conditions may lead (and especially in an industrial center where the air often possesses an acid reaction) is obvious when one compares the results of exposures made under the following conditions, upon, say, a direct cotton dyestuff.

a. In a vacuum.

b. In a vacuum containing a little water vapor.

c. In dry air.

d. In air containing acid vapors.

e. In moist air.

f. In air containing alkaline vapors.

Patterns a and b remained practically unchanged, c and d faded very slightly (c rather more than d), whereas e had faded very much, and in f the color was practically destroyed.

The fastness of the dyeing is not improved by a treatment with acid, for any diminution in the number of hydrogen ions by cotton (the presence of which is favorable to the permanence of dyed shades) results in an increase in the concentration of the perhydroxyl ions, which are directly harmful. The slow rate of fading in an "acid" atmosphere appears to disprove this, but it may be that it is merely a question of ionic concentration; below a certain concentration the hydrogen ions do not react with any part of the system (for instance, with the cotton, but above this concentration they may react with the fiber, and thus exert a harmful influence upon the conditions suitable to a preservation of the shade.

An atmosphere with an alkaline reaction (such as is often noticed in the country) greatly accelerates the rate of fading. To obtain comparable results of exposure it is therefore evident that a pure atmosphere is a prime necessity.

As regards the source of light, daylight, of course, would be most desirable, but besides the fact that the amount of sunlight and diffused daylight varies largely in different places, it must be remembered that some dyestuffs which fade in direct sunlight are regenerated in diffused light. Although this property may be valuable, it interferes with our obtaining those directly comparable results with which we are here interested, and one is forced to employ some kind of artificial light, the choice of which follows from a consideration of the effectiveness of different parts of the spectrum upon the reactions which occur during fading.

Peroxides, and peroxide hydrates of any dyestuff, are produced most largely by exposure to those rays which are complementary to the color. Exposed to such rays alone they are stable, but under the influence of violet and ultraviolet rays they decompose, or the active oxygen which they contain acts destructively upon the unchanged particles of dyestuff. It will often have been noticed that a shade which has changed but little by long exposure to a dull light fades much more rapidly when exposed to sunlight than does the same shade exposed to sunlight direct.

The following experiment may be instructive: Expose a solution of Alizarin in caustic soda (1) behind a blue glass screen, and (2) behind a yellow screen. Solution (1) fades much more rapidly than does (2), but to other conditions (subsequent oxidation or exposure to ultraviolet rays) it is much more resistant. Thus, treated with the same quantities of hydrogen peroxide (or potassium permanganate), (2) is rapidly decolorized, whereas (1) is not further changed. During the exposure behind the yellow glass, dyestuff peroxides were produced in quantity, and were decomposed by the reaction with

hydrogen peroxide or permanganate. In the case of the blue screen, small quantities of peroxide were produced by the exposure, but were immediately decomposed. The behavior of the peroxide may be demonstrated by adding a substance (magnesium oxide), which acts as a carrier of the peroxide like oxygen to the molecules of unchanged dyestuff; in this case the solution fades much more rapidly behind the yellow glass than it does behind the blue.

The influence of many such substances has been already referred to, but special mention may be made of the effect of

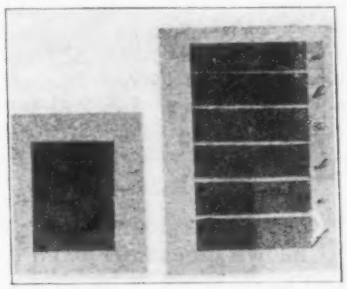


FIG. 3.

common salt. Many peroxides react with hydrochloric acid with liberation of chlorine, and some apparently react in a similar manner with sodium chloride, for attempts to obtain the dyestuff peroxides from their solutions by salting out with common salt resulted in the destruction of the peroxide, whereas success attended the use of sodium sulphate, the peroxide being obtained in the solid form. Weigert seems to have made a similar observation.

The different methods of fixing salts, acids, alkalies and dyestuffs upon the fiber, as also the composition of the compound of dyestuff and mordant, influences greatly the behavior of the dyestuff towards oxygen, the stability of the peroxide produced, and therefore the permanence of the dyed shade.

In determining the fastness to light it is imperative that these conditions should be taken into account, for unless full details as to the method of preparation and mode of dyeing are given, it is impossible to know definitely what the real fastness of the dyestuff may be. It is therefore recommended to compare exposures only of dyeings made in the manner specified as most suitable for the particular dyestuffs by the manufacturers of the same, and to make comparisons only upon shades of approximately the same depth.

The patterns for exposure should not be pasted or gummed upon a support, but should be suspended by clips or other suitable device, thus avoiding the disturbing influence of moisture or any ingredient present in the support.

In carrying out exposures the following conditions should be fulfilled:

1. The source of light should be (a) a lamp which gives the greatest possible amount of light in the bright part of the spectrum; (b) a lamp the light from which is rich in violet and ultraviolet rays.

(To be continued.)

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 97

BROWN ON COTTON YARN

Thion Brown T on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thion Brown T.
(Kalle & Co.)
20 lbs. Sodium Sulphide.
4 lbs. Soda Ash.
20 lbs. Glauber's Salt.

Dye at a temperature just below the boil for one hour.

Thion Brown T possesses good fastness to washing and light.

Recipe No. 98

YELLOW ON WORSTED YARN

Hydrazine Yellow L E 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Hydrazine Yellow L E 3 G.
(Geisenheimer & Co.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid

Enter at 140° F., bring slowly to a boil, and dye at a boil for one hour.

Hydrazine Yellow L 7 3 G is a level dyeing acid color and will be found excellent for the production of compound shades and self colors in wool dyeing.

—÷—

Recipe No. 99

BLUE ON COTTON YARN

Direct Dark Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Direct Dark Blue B.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
30 lbs. Common Salt.

Direct Dark Blue B dyes level and posesses the valuable properties of the direct cotton colors.

—÷—

Recipe No. 100

RED ON COTTON YARN

Benzo Fast Rubine B L on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Benzo Fast Rubine B L.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
20 lbs. Glauber's Salt.
1½ lbs. Soda Ash.

Dye at a boil for one hour.

Benzo Fast Rubine B L is adapted to all kinds of cotton dyeing. Its fastness to light is excellent for a direct cotton color.

—÷—

Recipe Nos. 101-102

BLACK ON WOOL GOODS

Logwood Crystals and Mordants: Logwood Crystals made from superior Hematine pastes are now available, and by some are preferred for the dyeing of Logwood Blacks on woolen materials. The necessity of choosing a correct mordant suitable for developing the full tinctorial power of the Logwood Crystals are illustrated by dyeings 101 and 102. These two dyeings represent the developments obtained from 10 per cent. Logwood Crystals (American Dyewood Co., 84 William St., New York) on two different mordants as follows:

A

3% Chrome.
3% Half Refined Tartar C.
1 % Bluestone.

B

3% Chrome.
2% Oxalic Acid.
2% Half Refined Tartar C.

The two dyeings were made by the standard dyeing process employed for coloring Hematine Pastes. The goods were first mordanted and then dyed in a separate bath, boiling 1 1/4 hours in each bath. Mordant A is the mordant recommended in the dyeing of Logwood Crystals.

The differences in development of the same amount of Logwood Crystals and other important points relative to the proper dyeing of Logwood Blacks are fully illustrated in their shade card No. 800, a copy of which will be forwarded on application.

—÷—

Recipe No. 103

BORDEAUX RED ON COTTON YARN

Diamine Fast Bordeaux 6 B S on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Diamine Fast Bordeaux 6 B S.
(Cassella Color Co., 182 Front St., N. Y.)
2 lbs. Soda Ash.
25 lbs. Glauber's Salt (Dessicated).

Dye at a boil for one hour.

Diamine Fast Bordeaux 6 B S gives an excellent shade of Bordeaux red, possessing the common properties of the direct cotton colors.

—÷—

Recipe No. 104

BROWN ON COTTON YARN

Immedial Brown B R S on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Immedial Brown B R S.
(Cassella Color Co.)
½ lb. Soda Ash.
2 lbs. Common Salt,
per ten gallons dye liquor.

Dye in a volume of liquor equal to 20 to 25 times the weight of the goods at a temperature just below the boil for one hour. Squeeze well and rinse thoroughly.

Immedial Brown B R S, as will be noted, is dyed without the use of sodium sulphide. Its properties are similar to the other sulphur browns.

—÷—

Recipe No. 105

VIOLET ON WORSTED YARN

Anthracyanine Violet 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Anthracyanine Violet 3 B.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
15 lbs. Glauber's Salt (Crystals).
5 lbs. Sulphuric Acid.

Enter at 150° F. and dye at a boil for one hour.

Anthracyanine Violet 3 B possesses, in general, excellent fastness, and is well suited for the dyeing of ladies' dress materials.

Recipe No. 106

BLUE ON COTTON YARN

Helindone Blue 3 G N on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Helindone Blue 3 G N.
(H. A. Metz & Co.)
5½ lbs. Caustic Soda Solution 40° Be.
12 gals. Water 104-120° F.
3 lbs. Hydrosulphite M L B Powder.

This mixture is stirred and allowed to stand until reduction is complete, as shown by yellow brown color of solution.

The yarn is worked in a bath made up with this solution, with sufficient water at a little over 100° F., until the material is thoroughly saturated. It is then rinsed, and exposed to the air for from 15 to 20 minutes to oxidize, and then boiled in a soap bath for one-half hour.

Helindone Blue 3 G N is especially suited for combination with Helindone Yellow 3 G N for the production of bright greens.

—÷—

Recipe No. 107

BLUE ON WORSTED YARN

Chrome Blue C A on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Chrome Blue C A.
(C. Bischoff & Co.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter at 120° F., bring slowly to a boil and dye at a boil for 3/4 of an hour. Then exhaust by adding

2 lbs. Sulphuric Acid.

Finally add

3 lbs. Potassium Bichromate,

and continue the boiling for from 1/2 to 3/4 of an hour.

Chrome Blue C A possesses excellent fastness to light and washing and will be found an excellent color for general use in wool dyeing.

—÷—

Recipe No. 108

YELLOW ON WORSTED YARN

Azo Milling Yellow R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Azo Milling Yellow R.
(Geisenheimer & Co., 189 Front St., N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Azo Milling Yellow R is a level dyeing color producing a somewhat reddish yellow and, in general, possesses excellent dyeing properties.

Recipe No. 109

YELLOW ON WORSTED YARN

Guinea Fast Yellow 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Guinea Fast Yellow 3 G.
(Berlin Aniline Works, 213 Water St., N. Y.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Guinea Fast Yellow 3 G possesses very good fastness to light and weather, and its fastness in other respects is also good.

—÷—

Recipe No. 110

BLUE ON WORSTED YARN

Neptune Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Neptune Blue B.
(Badische Co., 86 Federal St., Boston.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil and dye at a boil for one hour.

Neptune Blue B produces a very bright and clear shade of blue possessing very good fastness to light. It may be used in combination with other colors.

—÷—

Recipe No. 111

BLUE ON COTTON YARN

Direct Blue 6673 on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Blue 6673.
(Innis Speiden & Co.)
20 lbs. Common Salt.

Enter at 160° F. and dye at a boil for one hour.

Direct Blue 6673 possesses the valuable properties of the direct cotton colors.

—÷—

Recipe No. 112

BLUE ON COTTON YARN

Naphtamine Blue 12 B on 100 lbs. cotton yarn. Prepare the dye bath with

1½ lbs. Naphtamine Blue 12 B.
(Kalle & Co., 530 Canal St., N. Y.)
1 lb. Puropol.
5 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Naphtamine Blue 12 B is easily soluble, dyes level, and will be found valuable in the dyeing of knit goods and mercerized fabrics. After-treatment with copper sulphate makes the shades greener and duller but renders them faster to light.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Warp Sizing Machine. Alfred Suter, 487 Broadway, New York. An improved warp sizing and drying machine built by Gebrueder Sucker, Gruenberg, Germany, which is described in another part of this issue.

Dogless Attachment for Ribbers. The Wildman Manufacturing Co., Norristown, Pa., have recently brought out a dogless attachment for the Wildman ribbers, which is described in another part of this issue.

Indigo Dyeing Machine. L. H. A. Schwartz & Co., 53 State St., Boston, Mass., are introducing to the American trade an improved machine for dyeing indigo on piece goods. A description will be found in another part of this issue.

Revolving Flat Card. Potter & Johnson Machine Co., Pawtucket, R. I. An improved revolving flat card which is described in another part of this issue.

Oxidizing Machine. Felber, Jucker & Co., Manchester, England. An improved mouth piece for aniline oxidizing apparatus. It allows the cloth to enter and leave the chamber without the passage of air in either direction.

Open Width Washer. L. P. Hemmer, Aachen, Germany. An improved cloth washer for handling goods in the open width. During the washing process the cloth passes over a perforated roll connected with a plunger pump. The liquor is alternately forced and sucked through the cloth, thus effecting a thorough cleansing of the goods.

Dyeing Machine. Fr. Gebauer, Berlin, Germany. An improved machine for dyeing textile materials by the circulating process.

Mercerizing Machine. Diedrich Habel, Berlin, Germany. An improved machine for mercerizing piece goods. He has also developed a machine on the same principles for mercerizing yarn.

Yarn Winder. George Hattersley & Sons, Keighley, England. A machine for winding yarn into cheeses with a cross wind.

Cotton Waste Card. John Hetherington & Sons, Manchester, England. An improved card for cotton waste which is being introduced into English mills.

Locking Motion for Cards. The Bradley Machine Co., Bolton, England. An improved device for locking the doors of card covers when the machine is in operation.

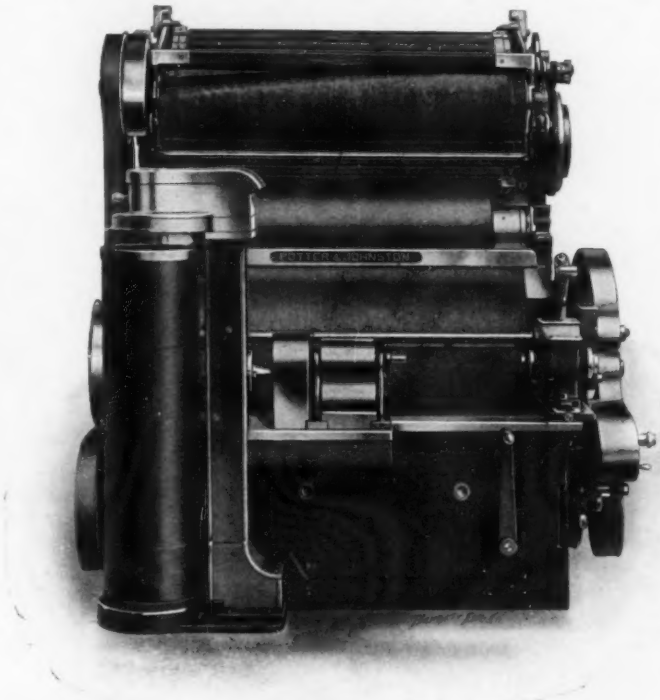
Velvet Loom. R. and J. Dantzer, Amiens, France. An improved loom for weaving velvets which, it is claimed, is capable of a much larger production than is obtained from the ordinary loom, with a corresponding reduction in the cost of manufacturing.

Decorticating Machine. Greenwood & Batley, Ltd., Leeds, England. An improved decorticating machine for treating aloe, sansevieria, pineapple, banana, New Zealand hemp, and similar plants.

Dobby Motion. Ward Bros., Ltd., Blackburn, England. A dobby motion embodying a number of improvements.

AN IMPROVED REVOLVING FLAT CARDING MACHINE

The revolving flat carding machine shown in the accompanying illustrations built by the Potter & Johnston Machine Co., Pawtucket, R. I., is now being introduced to the cotton manufacturing industry. It embodies a number of new and important features which have been patented by the designer and inventor, James C. Potter. In the construction of the machine, nothing has been spared to make it a card of the highest quality. The cylinder and doffer shafts have been greatly enlarged and are made of steel, carefully ground after turning. The bearings are lined with government bronze and are self-oiling and self-aligning; the cylinder and doffer are of very heavy section and carefully machined, balanced and ground on special machinery put down for this work, and the builders guarantee perfect running cylinders and doffers. The feed plate and feed roll are of new design and insure a perfect grip on the cotton and there is no pulling in. The single belt shown in Fig. 1 takes the place of four belts on this side of the card and two belts on the left hand side, Fig. 2. There is only one belt to care for in place of six. To grind the card it is only necessary to pull out the knob shown on the flat driving pulley and cross the main driving belt. The advantages of this drive are obvious, as all working parts of the machine move in harmony with each other, thus preventing choking up at the comb, doffer, licker-in or top flats. The comb is geared to the doffer and has a constant speed, that is to say, no matter whether the doffer runs at four revolutions per minute or twenty revolutions per minute. The speed of the comb varies with the speed of the doffer and is always in time, thus under all conditions doing its work properly.



FRONT END VIEW OF THE IMPROVED REVOLVING FLAT CARDING MACHINE

The starting handle acts through a friction

clutch and starts the card gently without any jar and also acts as a slow motion; the calender roll driving shaft is below the plate, and the end of the machine is so constructed that it is smooth and free from all projections that might catch and accumulate fly and dirt. It is also arranged that there are no drafts or undercurrents of air to disturb

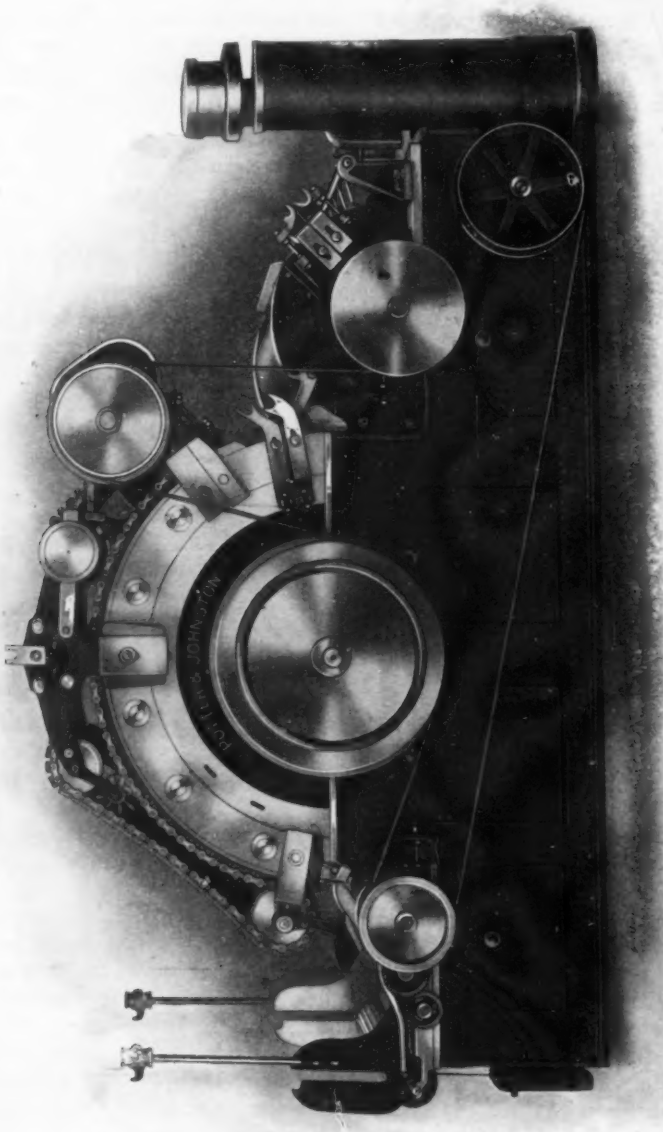


FIG. 1. THE RIGHT HAND VIEW OF THE REVOLVING FLAT CARD.

the cotton while passing between the doffer and the calender rolls.

crometer screws to the flexible bend, which they guarantee can be set to one one-thou-

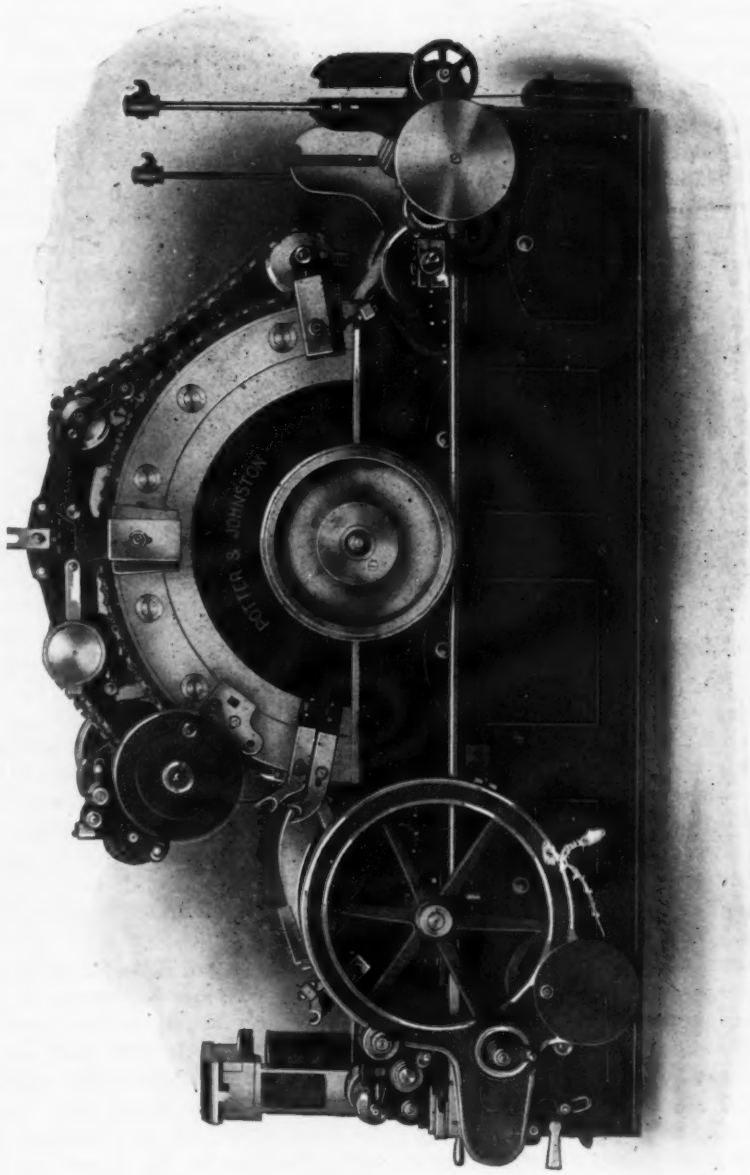


FIG. 2. LEFT HAND VIEW OF THE POTTER & JOHNSTON REVOLVING FLAT CARD.

The new setting arrangement has been carefully carried out and the dials shown on the rigid bends communicate through mi-

sandth of an inch and is practically locked, as a special wrench has to be used which prevents the adjustment from being tamp-

ered with. The flats are driven by a differential gear of scientific construction and gives a substantial, smooth and easy drive. They are ground from their working seatings by an improved device and the position of the flats are such that the only flat under tension is the one that is being ground. The nuts and screws on the machine are all case hardened and of large diameter and only two sizes of screw heads and nuts are employed. Thus a double-ended wrench covers all sizes. All sliding brackets are of liberal dimensions carefully milled and scraped. All bearings are lined with bronze, all studs are steel hardened and ground; all gears are cut, some of which are steel, hardened and ground, the center distances are correct, in fact the machine is as carefully and as well made as a high class machine tool and will stay where it is set and run practically noiselessly.

William Muir, Providence, R. I., is the Northern representative of the company and J. H. Mayes, Charlotte, N. C., is the Southern representative.

THE AUTOFORCE VENTILATING SYSTEM

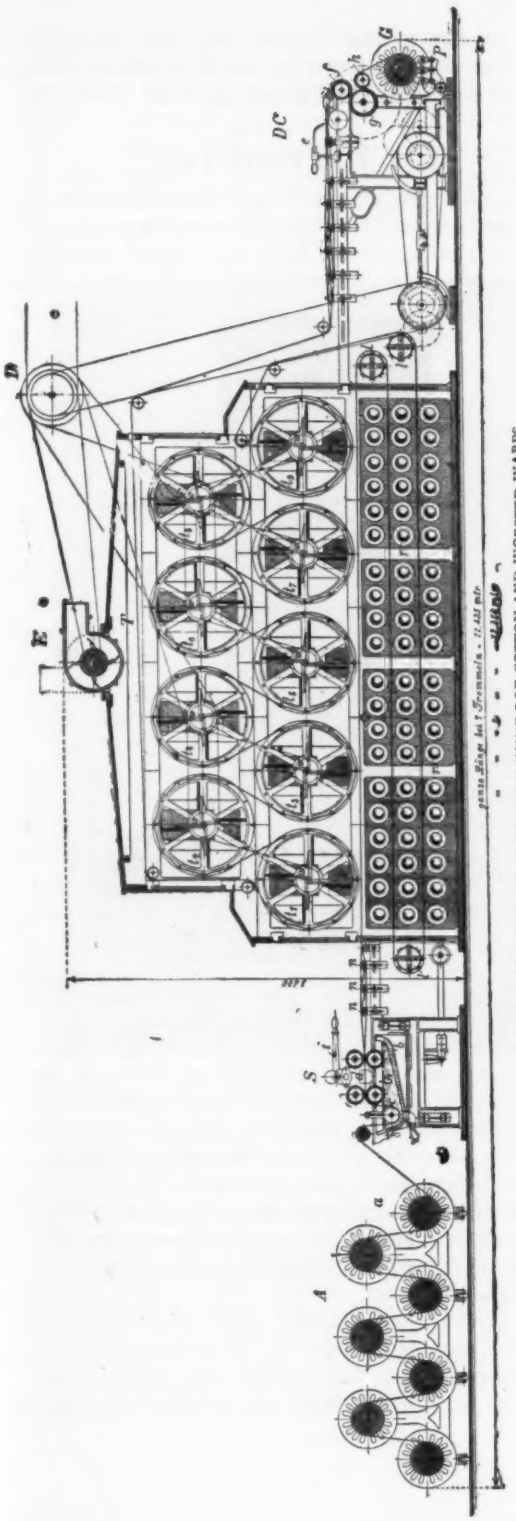
It is claimed that the Autoforce ventilating system so harnesses the air currents and the sun's rays as to accomplish the work of an artificial power system. In this way general ventilation is obtained without the dangers or expense of power. It is claimed that a definite and known displacement is obtained under all conditions of wind or weather, which is essential in regulating the humidity in textile mills. The Autoforce Ventilating System, 53 Devonshire St., Boston, Mass., have taken many difficult problems on a guaranteed basis about the city and throughout New England. Their engineers state that the public has but a limited knowledge of the powers of the air currents which are always in motion at an average rate of about fifteen miles an hour and at a sufficient velocity to operate their device, assuring a continuous upward suction flow of air. The power of this element is just beginning to be realized by the bird-men, so-called, brought about by the new era and aviation.

IMPROVED SIZING AND HOT AIR DRYING MACHINE FOR COTTON AND WORSTED WARPS

The illustration shows the improved warp sizing and drying machine built by Gebruder Sucker, of Grunberg, Germany, for whom Alfred Suter, 487 Broadway, New York, is the American agent.

The yarn is delivered to the sizing machine over one beam holding the complete warp, or from a number of warp beams. It passes in the form of a sheet over guide rolls into the size box, S, where the immersion roll, e, can be adjusted to give a long or short passage through the size as desired. The yarn then passes between two squeeze rollers, a uniform pressure being obtained by levers and weights. The size trough, b, is fitted with a copper pan, b', the space between them being filled with water heated by steam. The size thus comes in contact with a surface heated by water only, which prevents the formation of baked particles of size on the pan. The wet warp is split by the dividing rod, n, and slipping brushes may be used for a very smooth warp if desired. The warp then passes to the drying chamber, which is enclosed, to prevent the escape of heat. All parts of the chamber are, however, easily accessible and the windows enable the operator to watch the progress of the work inside. The yarn passes between three sets of heating pipes, this arrangement being protected by patents. The yarn is fully exposed to the heat and dries rapidly, enabling a large production to be obtained from a machine.

An exhaust fan, E, is placed at the top of the drying chamber to remove the damp air. The skeleton drums in the lower row are connected at each end with the heating chamber at the bottom of the machine. The fans in the bottom drums draw hot air from the heaters and force it through the warp, while the fans in the upper row of drums have no connection with the heaters, but draw cool air from the work room through openings at the side of the machine. Thus the yarn is subjected alternately to currents of hot and cool air, which, it is claimed, im-



A SIZING AND HOT AIR DRYING MACHINE FOR COTTON AND WORSTED WARPS

parts a peculiarly soft feel to the material. By thus drying first the outer shell in a quick process and then the core slowly by a strong draft of warm and cool air a double heat penetration is obtained, which fixes all the size to the yarn, and prevents the rubbing-off in the loom. The yarn also remains round as it does not touch any support until its outer shell is dryed. The drums run on ball bearings, thus avoiding any undue strain on the yarn. These bearings, which are not exposed to the heat, are provided with self-oilers and collars which prevent the oil from getting on the yarn.

On leaving the drying chamber the warp is split by dividing rods and then passes through an expanding loom beam, G. A measuring and marking motion requiring no change wheels marks the cuts for any length from 5 to 150 yards, in fractions of 2 inches, and also registers the number of cuts passed through the machine. The machine is driven by a special device, consisting of the drawing-off rollers, f, g and h, and a friction arrangement, so that the necessary tension is obtained, giving a hard and uniform beam. The draw roller, g, is connected by a side shaft with the rollers in the size box so as to maintain a uniform speed for the feed and delivery. By means of the cone drums, the speed of the machine can be adjusted so as to give from 5 to 30 yards per minute according to the size of the yarn and class of work. There is also a slow motion which enables the machine to be run at one-tenth of the full speed.

Further information concerning this machine can be obtained from the American agent.

During the 1909-10 season there were 818,330 bales of wool sold in Sydney, Australia, representing a value of approximately $55,000,000.

The employes of linen mills of the United Kingdom number about 96,000, whose average earnings in the pay week of September, 1906, was $2.90. The average weekly earnings of foremen working full time in Irish mills was $8; roughers, $5.11; sorters, $5.26.

THE "CHICAGO" WATCHMAN'S CLOCK.

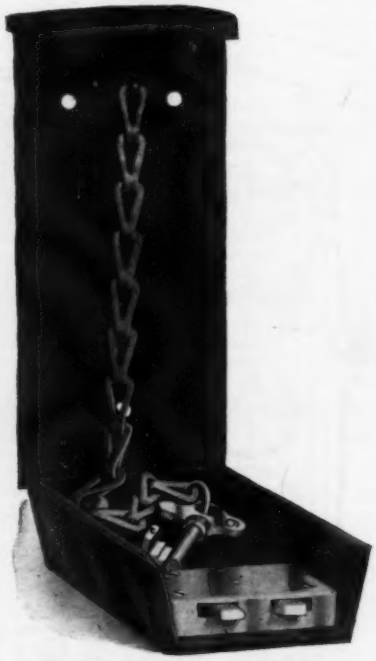
The illustration shows the latest model of the Chicago portable clock for night watchmen which is designed to eliminate all of the weak features of watchmen's clocks. One of the important features is the method used in constructing station keys. Each key is made so that no wear comes on it and a perfect record is obtained on the dial at all times. The keys are made of a non-rusting material and will last for many years. The clock is made with the best movement obtainable and the registering mechanism is so

THE "CHICAGO" PORTABLE CLOCK

constructed that it will give good service under all conditions. The clock has a time dial in addition to the recording mechanism and is carried in a leather case by the watchman to the different stations. The station keys are securely fastened in the station boxes, which are sealed. The watchman is thus compelled to go to each station to make the record. This clock has been approved by the National Board of Fire Insurance Underwriters. Manufacturers state that it will give good service for 25 to 30 years and they claim that it is the best clock on the market today. Further particulars can be obtained from the Watchman's Clock & Supply Co., 9 Church St., New York City.

FIRE PROTECTION

A most important question which must be considered by the small town, the coast communities, and the large or isolated manufacturing plant has reference to fire protection.

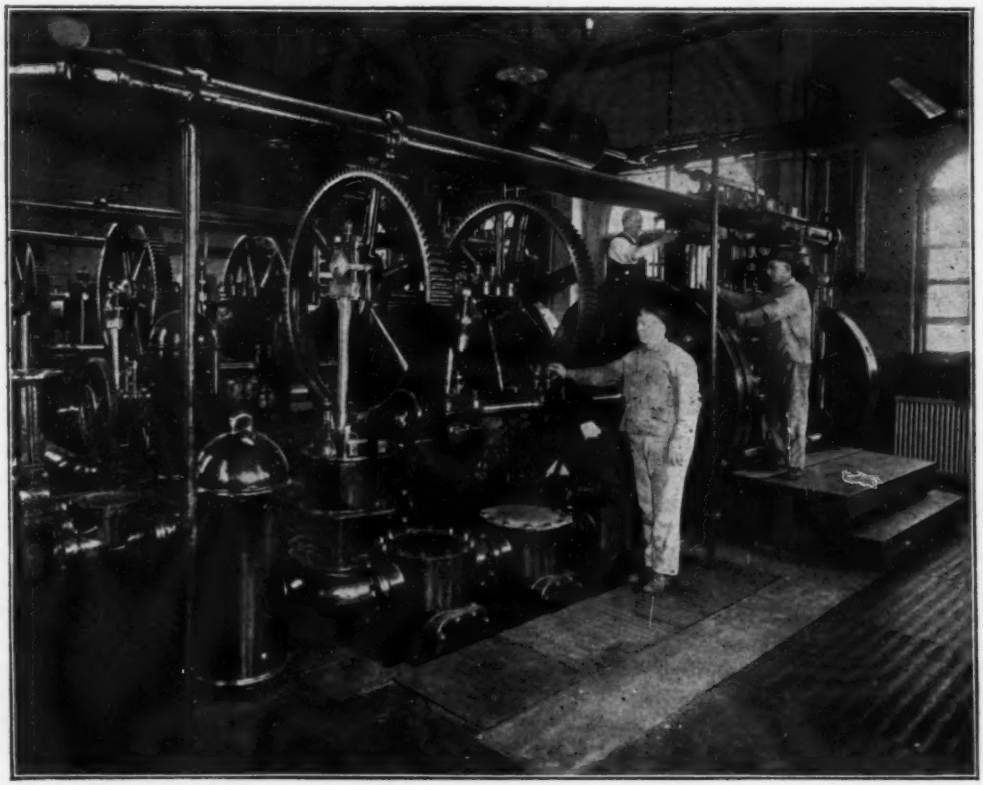


ONE OF THE STATION KEYS FOR THE "CHICAGO" PORTABLE CLOCK

The matter of expense enters in pretty much every such case. In addition, there is the problem of an adequate water supply under sufficiently high pressure. It is possible, and this has been proven in numerous instances, to solve the whole problem by means of a powerful pumping plant operated only when necessity arises. One of the most notable cases is that at Coney Island, the New York pleasure resort.

The buildings at this place have been and are very inflammable. In consequence of the conditions, fire policies were limited to 10 per cent. of the value, and a 5 per cent. rate

charged. The location is distant from the general fire system of the Borough of Brooklyn. To maintain an adequate number of fire steamers to cope with the possibilities would have entailed a very heavy expense. An abundance of water was, however, available. First, there was the city supply; and second, the salt water of the immediate vicinity, if such water could be used. The question of power was, of course, important. What was needed was a solution of the power question which would enable a large total of power to become available quickly, and would entail little or no expense in the intervals when not required. This problem was successfully solved by using gas engines and supplying them with ordinary illuminating gas. A large gas-holder was situated near by; with this suitable connections were made. Three Nash gas engines of the vertical, three-cylinder, four-cycle type were installed. The valves of one cylinder in each engine are arranged to permit the use of compressed air to start it off. There are two separate air compressors. There are storage tanks for compressed air, with capacity equal to starting all engines twice. The compressed air starts the engine forward, operating through one of the three cylinders. The other two cylinders quickly develop power from the gas —in one or two revolutions, in fact. The engine is put into full operation by gas in 20 seconds. All three engines and the whole plant can be put into full operation in about 2 1/2 minutes.

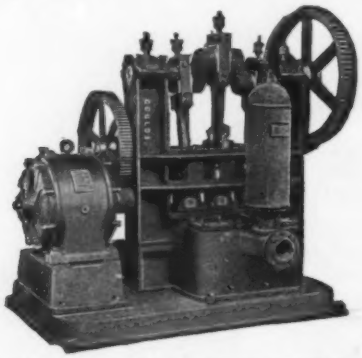


A LARGE PUMPING PLANT FOR FIRE PROTECTION. ONLY USED WHEN NEEDED. CAN BE STARTED IN TWO MINUTES

This power equipment drives a very effi-

cient pumping plant. This consists of three triplex double-acting piston-pumps built by the Goulds Manufacturing Co., Seneca Falls, N. Y. Each of these pumps is directly connected to one of the gas engines, and forms with it a water handling equipment independent of the other pumps.

The total capacity of the three pumps is 4,650 gallons per minute. The pressure is 150 pounds per square inch at the pumps. For a hydrant 7/8 mile away, the pressure falls only to 140 pounds, when the full capacity of the



GOULD'S TRIPLEX DOUBLE-ACTING PISTON-PUMP

plant is employed. The area protected totals about 65 acres. There are numerous hydrants so distributed that the whole energy of the pumping plant can be concentrated upon any one block of buildings. These hydrants have 2 1/2-inch hose connections, and are joined to the service mains by 8-inch piping. The full capacity of 4,650 gallons per minute can be developed with 15 to 20 streams. Either one, two or three of the pumps may be used as desired.

Such a pumping plant seems to have been admirably conceived. It is economical, as it is operated only when needed. The attendance expense is low. It can be started up with great rapidity and with great certainty. The whole plant need not be put into operation, if the situation does not require it. And the starting up of the plant does not depend upon the muscular strength of the persons at the moment in attendance. A great volume of water per minute is vailable. Further the streams are very powerful, so that considerable heights can be reached. A pressure of 140 pounds per square inch is equivalent to that obtainable from an elevated tank or a standpipe 320 feet high.

TEXTILE POWER PLANT DEVELOPMENT IN NEW ENGLAND

BY JOHN S. NICHOLL

In certain industries, as the electric lighting, there is hardly any question but that the large central power station with its economical turbines and low cost of maintenance and operation is able to deliver power to the consumer at a lower cost per kilowatt than he could produce it by any plant of his own. When, however, it comes to such fields as the textile, where the waste product of the steam is valuable for some of the manufacturing processes, the central station will experience considerable difficulty in contracting with most textile mills for power, except under the most advantageous conditions for the central station and the most disadvantageous conditions for the textile mill.

That this is true in New England is evidenced by a consideration of some of the power plants which have been erected during the last year or so. A few of the typical plants in the North are here described and it can be said that each of these presents a solution of an interesting problem. As an excellent example of what can be done in centralizing the scattered plants of a large cotton mill, may be cited the new central plant of the Massachusetts Cotton Mills, designed by Lockwood, Greene & Co., Boston. The power for the mills was formerly delivered by water wheels and isolated steam plants. The new power station will contain two water wheels and a 1,500 k. w. turbine. Considering the very limited available space and its peculiar location the design has been pronounced remarkable. The coal-handling system is also one of the features, the fuel being handled automatically from the time it leaves the coal pile until it reaches the ash heap.

Until recently the plants of the Bigelow Carpet Co. of Clinton, Mass., were operated as two separate mills. The spinning mill is located on the Worcester & Nashua Division of the Boston and Maine R. R., and the

other mill, known as the Axminster Weaving Mill, where the dyeing and hackling and weaving of the rugs and carpets are done, is an eighth of a mile distant. Each mill contains an independent power plant, though all the current for lighting was furnished from the weaving mill. The company decided, after an investigation by its engineer, Charles T. Main, of Boston, that very material economy in operation could be secured by concentrating the power generating units into one plant. Mr. Main was accordingly instructed to proceed with the design and erection of a new power plant. A further consideration leading to the erecting of a central power plant was the anticipated expansion of the weaving mill.

The boiler equipment of this plant consists of eight old boilers which were removed from the Axminster Mill power plant, and six new boilers, there being available space for two additional boilers to be installed later. All boilers are of the horizontal return tubular type. The engine-room equipment consists of a 26 by 48 by 42 horizontal cross-compound condensing engine, direct-connected to a 750 k. w. generator and a 20 by 36 simple non-condensing engine, direct-connected to a 300 k. w. generator. Space is also left in the engine room for an additional unit of 750 k. w. or greater capacity.

There are two steam pressures in the plant, a high pressure system of 125 lbs. to provide steam for the main engines and auxiliaries and to the dye house, and a low pressure system of from 5 to 10 lbs., supplying the steam to the feed water heater and the heating system of one mill. There is also a vacuum system in which the vacuum is kept at the proper point to maintain the desired temperature of the overflow water going to the dye house.

From the tests which have been made on this new power plant it has been shown that its erection and the dismantling of the two independent plants were based on sound engineering, as the cost of the power is less, considering not only independent charges such as interest, insurance, depreciation and taxes and to a certain extent repairs, but also charges which are proportional to the output including coal, labor, supplies, etc.

Of course there are many advantages to mills purchasing electric power provided they do not take into consideration the saving which could be effected if they used low pressure steam and warm water for heating and manufacturing purposes. Less space, less care and the postponement of the introduction of a power plant are items which appeal to the company starting a new enterprise, but that an isolated plant when efficiently operated and the waste product of steam utilized, produces power evidently cheaper, is illustrated by the case of the Royal Weaving Co. at Pawtucket, R. I., who built their power plant in order to relieve them from purchasing power from the Pawtucket Electric Co. Charles T. Main, engineer of Boston, who designed the power plant, submitted preliminary estimates for both an engine driven and a turbine driven power plant, the figures for both types being practically the same. The owners decided to install the turbine driven plant for which the estimated cost of power per kilowatt hour would be in the neighborhood of 1.3 cents.

The installation consists of four 350 h. p. water-tube boilers equipped with superheaters. These are connected through an economizer to a chimney 175 ft. high. The main power units consist of three 5,500 turbine alternators with exciters and switchboard. There are four double fan cooling towers, each one driven individually by a motor. All of the auxiliaries, consisting of the engines, condensing apparatus, boiler feed pump, domestic service pump, circulating pump for the cooling tower, exhaust into one system which is connected with the feed water heater.

The Manufacturers Power Co. of Woonsocket, R. I., is an interesting solution of a mill power problem and is certainly a new departure. This power plant has been erected solely to furnish power for two neighboring mills, owned and operated by different companies. The mill owners considered it an important economy to build one plant sufficiently large to supply the needs of both mills and accordingly the Manufacturers Power Company was organized by the two companies operating the independent mills, and each mill purchases power from this com-

munity power company. The two mills and the Power Company's plant are located on the east bank of the Blackstone River, about half way between Woonsocket and Blackstone. The power house is located directly on the bank of the river in order to facilitate the obtaining of condensing water. Directly back of the power house away from the river is located the Samoset Mill, designed by Charles T. Main, of Boston, which is for worsted spinning and is equipped throughout with induction motors. Across Harding Street, on the river bank, is located the new Nyanza Mill, built to produce high-grade hosiery yarns. This mill was erected in accordance with plans and specifications of Lockwood, Greene & Co., of Boston. Induction motors are used for driving machinery throughout the mill. The designs for the power installation of the new central plant was furnished by Lockwood, Green & Co., of Boston, who also supervised the entire work of construction.

The boiler equipment consists of six 225 h. p. 74 in. vertical Manning boilers. The smoke flue is located on the center line of the building on a level with the top of the boilers, while the stack is 200 ft. high with a 9 ft. flue.

The main power unit consists of a 1,200 k. w. turbine alternator. The condenser and its auxiliaries are located in the engine room basement immediately below the turbine. This plant thus has all the advantages of a central power station while, at the same time, it is located by the mills and the exhaust steam can be used for manufacturing purposes, which would not be the case if located at some distance.

It will be seen that the probable tendency in New England as far as textile mill power plants are concerned, is to centralize the scattered plants, while the purchasing of electric power from an outside central station has been discontinued in several instances. It is also very notable that manufacturers are more and more calling in consulting engineers to thoroughly investigate all the conditions before making any final decision as to the character of the prime movers. The result of this has naturally been that the new power plants are very efficient.

FIG. 1. APPARATUS USED FOR MAKING THE TESTS OF THE REEVES' VARIABLE SPEED TRANSMISSION

The total number of flax spindles in Belgium is approximately 325,000, of which 235,600 are in Ghent and 24,500 in Courtrai, the remaining 64,900 spindles being divided between other cities.

TESTS OF THE REEVES' VARIABLE SPEED TRANSMISSION

Power users will be interested in the result of a series of tests recently made by the Reeves Pulley Co., Columbus, Ind., to determine the efficiency of their variable speed transmissions at various loads and speeds.

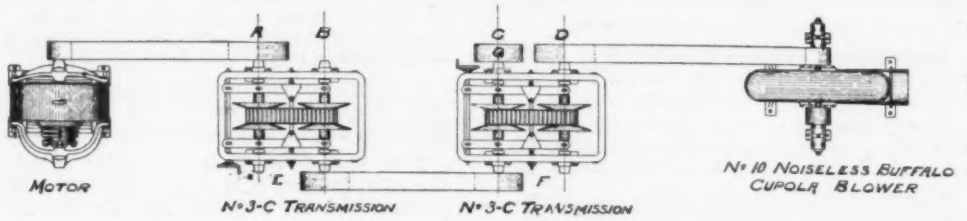


FIG. 2.

the fan being used to secure the proper loads.

All tests were first made with the machine belted up, as shown in Fig. 2. Then a second lot of tests were made at the same speeds and loads, but without the transmission next to the motor, belting direct from the motor to pulley, G.

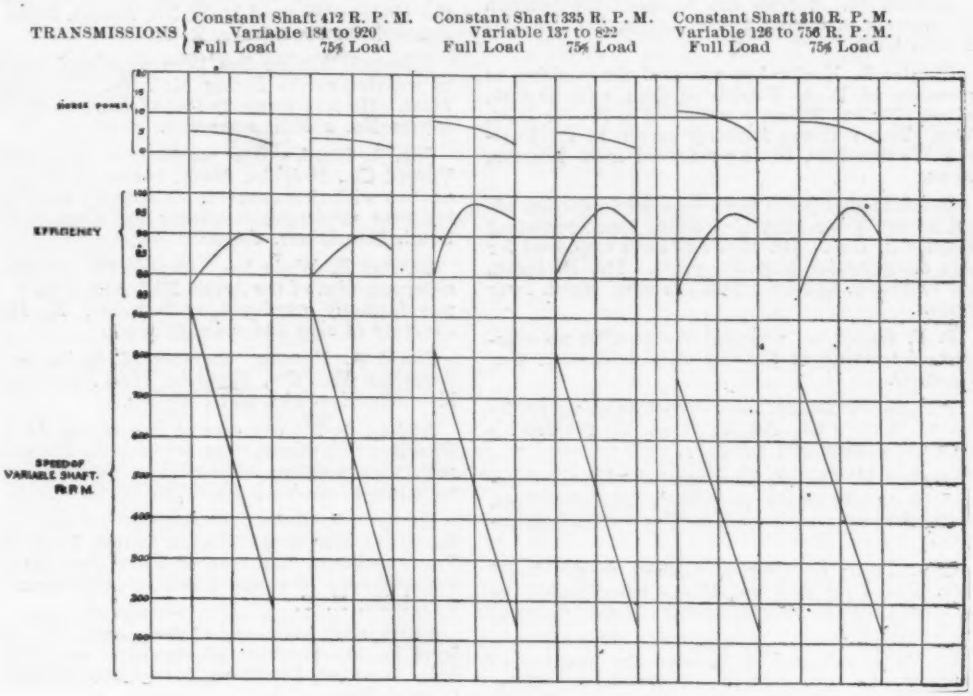


FIG. 3.

Fig. 1 shows the apparatus used in making the tests, the line drawing, Fig. 2, giving a clearer idea of the arrangement of the machines.

The transmission being tested is shown near the motor, the other transmission and

Fig. 3 shows the power transmitted and efficiency at all speeds of the variable speed shaft.

In 1907 the total estimated number of cotton spindles in the world were 114,096,168.

Personals

Wm. McClure, overseer of carding, departments 9 and 10, New England Cotton Yarn Co., New Bedford, Mass., has severed his connection with that company to accept a position as overseer of carding at the Neild Mfg. Co., same city.

Hugh Fraser, overseer of finishing at the Lawrence Webster Co., Malone, N. Y., has severed his connection with that company.

John Jones has accepted the position as overseer of carding at the Allen Woolen Mills, Rochester, N. Y. He comes from Gleasondale, Mass.

Fred E. Neff, overseer of finishing at the Rockville Worsted Co., Rockville, Conn., has resigned to accept a similar position with the J. J. Regan Mfg. Company, same city.

E. S. Johnson, overseer of spinning at the A. H. & C. B. Alling Co., Derby, Conn., has resigned.

Edward W. Morgan has accepted the position as overseer of dyeing at the Knight Woolen Co., Provo, Utah.

Charles B. Harley has accepted the position as manager of F. A. Patrick & Co.'s mill, Duluth, Minn. He was formerly employed at Beaver Dam, Wis. This mill was formerly known as the Fosston Woolen Mill, having removed from Fosston, Minn.

Frank Hodgson has been appointed superintendent of the York Mfg. Co., Saco, Me., succeeding Horace S. Hall. Mr. Hall had been employed for this company for fifty-nine years. Mr. Hodgson, his successor, has been with the corporation forty years.

B. F. Hayes has accepted the position as overseer of weaving at the Orr Felt & Blanket Co., Piqua, O.

Thomas H. Kenny, overseer of finishing at the Adams Woolen Co., Adams, Mass., has severed his connection with that company.

Stephen H. Oatley, for a number of years overseer of carding at the Quinebaug Co., Danielson, Conn., has severed his connection with this company.

Chas. Pratt, overseer of carding at the Neild Mfg. Co., New Bedford, Mass., has resigned to become assistant superintendent of the Gosnold Mill, same city.

D. M. Tompkins has accepted the position as overseer of spinning at the Seneca Cotton Mills, Seneca, S. C. He comes from Camden, S. C.

James Broome, formerly overseer of the cloth room at the Boyd-Mangham Mfg. Co., Griffin, Ga., has accepted a similar position with the Home Cotton Mills, of Elberton, Ga.

J. F. Wofford has accepted the position as overseer of spinning at the Lincoln Cotton Mills, Southside, N. C.

H. T. Wallace has accepted the position as overseer of weaving at the Ella Mills, Shelby, N. C. He comes from Kannapolis, N. C.

Wilfred Ward, manager of the Greetland branch of the Bradford Dyers' Association, has been appointed manager of the new plant which the Association is to build at Bradford, R. I.

J. F. Henry has accepted a position as overseer of spinning at the Boston Mfg. Company, Waltham, Mass., succeeding Wm. H. Dyer.

F. B. Sawtell, overseer of spinning at the Pontiac Mill, Pontiac, R. I., has resigned to accept a position with the Harmony Mill, Cohoes, N. Y.

P. F. Hanlin, superintendent of the finishing department at the Atlantic Mills, Stottville, N. Y., has resigned on account of ill health. He will take a few months vacation in the Maine woods.

John Gormley has been appointed designer at the Hoosac Worsted Mills, No. Adams, Mass. He comes from Providence, R. I.

Edmond Wilding has been appointed overseer of weaving at the Parker Mill, No. 1, Fall River, Mass. He was formerly second hand at the Hargraves No. 2 Mill, same city.

Jno. A. Hood, master mechanic at the American Thread Co., Holyoke, Mass., has severed his connection with that company to accept a position as assistant mechanical engineer for Cheney Bros., South Manchester, Conn.

Charles E. Wade has accepted the position as superintendent of the Arctic Mill, Arctic, R. I. He was formerly employed at Suncook, N. H., as overseer of ring and mule spinning.

David A. Provost, overseer of dyeing at the American Felt Co., Franklin, Mass., has severed his connection with that company.

Andrew Smith, overseer of dressing at the Falls Co., Norwich, Conn., has severed his connection with that company to accept a similar position with the Ponemah Mills, Taftville, Conn.

Herbert F. Robinson, overseer of carding at the No. 3 Mill of the Warren Cotton Mills, West Warren, Mass., has severed his connection with that company to accept a similar position at Victory Mills, N. Y.

Louis Jonah has accepted the position as second hand in the spinning department at the Parkhill Mfg. Company, Fitchburg, Mass. He comes from Clinton, Mass.

Chas. S. Lord, assistant agent of the Burlington Mill, American Woolen Co., Winooski, Vt., has resigned and is succeeded by E. S. Johnson.

James Hirst, superintendent of the Jos. Noone's Sons Co., Peterboro, N. H., has severed his connection with that company. He is succeeded by I. E. Small, who was formerly with the National Woolen Co., operated by the same company at Waterville, Me.

Edward Tetley, overseer of weaving at the Beaver Brook Mill, American Woolen Co., Collinsville, Mass., has severed his connection with that company.

J. B. Meacham has accepted the position as overseer of spinning at the Elmira Mills, Burlington, N. C.

James A. Greer, who has for some time held the position of assistant superintendent of the Avondale Mill, Birmingham, Ala., will on June 20th take charge as superintendent and buyer for the reorganized Buck Creek Mills at Siluria, Ala.

Geo. C. May has resigned the superintendency of the Argonaut Cotton Mills, Covington, Ky., and has accepted a similar position with the Bonham Cotton Mills, Bonham, Tex.

J. C. Foster, overseer of spinning at the Fountain Inn Cotton Mills, Fountain Inn., S. C., has severed his connection with that company.

C. E. Bailey has accepted the position as overseer of spinning at the Muscogee Mills, Nos. 3 and 4, Columbus, Ga.

G. H. Godfrey has accepted the position as overseer of the cloth room at the Norris Cotton Mill, Cateechee, S. C. He comes from the Toxaway Mill at Anderson, S. C.

B. M. Rose has been appointed superintendent of the E. M. Holt Plaid Mill at Burlington, N. C. He comes from the Mineola Mill at Gibsonville, N. C.

R. A. Whatley has returned to his former position as overseer of weaving in Mill No. 1 of the Fulton Bag & Cotton Mills, Atlanta, Ga.

William Woodworth, Jr., has accepted his former position as overseer of spinning at the Fonda Glove Lining Co., Fonda, N. Y.

Wm. M. Lacey has been appointed superintendent of the Auburn Woolen Co., Peterboro, Ont., Canada. He comes from Pascoag, R. I.

L. W. Cuddy has been appointed superintendent of the Bibb Mfg. Co., Columbus, Ga. He was formerly boss spinner at the Kilburn Mill, New Bedford, Mass.

Harry K. Drew, superintendent of the B. B. & R. Knight's mill at River Point and Arctic, R. I., has severed his connection with that company.

Wm. D. Crawford has accepted the position as overseer of weaving at the Hamilton Woolen Co., Amesbury, Mass. He was formerly employed at the Shetucket Co., Norwich, Conn.

Morris J. Lannon, overseer of finishing at the Richelieu Woolen Mill, Willetts Ltd., Chambly Canton, P. Q., Canada, has resigned to accept a similar position with the Allen Woolen Mills, Rochester, N. Y.

Urick Laplante has been appointed overseer of finishing at the Richelieu Woolen Mill, Willetts, Ltd., Chambly Canton, P. Q., Canada, succeeding Morris J. Lannon.

W. H. Layfield, overseer of finishing at the Allen Woolen Mill, Rochester, N. Y., has severed his connection with that company.

LeRoy E. Dwelly has been appointed overseer of carding in departments 9 and 10 of the New England Cotton Yarn Co., New Bedford, Mass. He comes from Fall River, Mass.

G. F. Horman has accepted the position as boss carder at the South Acton Woolen Co., South Acton, Mass.

James P. Ryan has accepted the position as overseer of finishing at the Adams Woolen Co., Adams, Mass. He comes from Pittsfield, Mass., and succeeds Thomas H. Kenny.

Wm. E. Chamberlin has accepted the position as overseer of finishing at the Nasonville Woolen Co., Nasonville, R. I. He was formerly employed at the Montrose Woolen Co., Woonsocket, R. I.

Robert Johnson has accepted the position as overseer of spinning at the Auburn Woolen Co., Peterboro, Ont., Canada. He comes from Peace Dale, R. I.

James M. Munro has accepted the position as designer at the Scotia Worsted Mill, Woonsocket, R. I.

Ralph Whitehead, for the past twenty-seven years overseer of weaving at the Assabet Mills, Maynard, Mass., has severed his connection with that company.

John Stubbs, overseer of dressing at the Ponemah Mills, Taftville, Conn., has severed his connection with that company.

Leslie H. Morse, for the past three years assistant engineer at the Blackstone Mfg. Co., Blackstone, Mass., has severed his connection with that company.

Edward Deverell, overseer of weaving for A. L. Sayles & Son, Pascoag, R. I., for the past 25 years, has severed his connection with that company.

John Paisley, overseer of the bleaching department at the Pacific Mill, Lawrence, Mass., has severed his connection with that company. He has been in their employ as overseer for the past thirty years and is succeeded by Nelson Hulme.

Thomas Pierson, overseer of carding at the Utica Yarn Co., Utica, N. Y., has severed his connection with that company.

Fred C. Engel, for the past twenty years overseer of dyeing at the Dustin Island Woolen Mill, Penacook, N. H., has resigned. His successor is James Lapraik.

John Ryan, overseer of finishing at the Berkshire Woolen & Worsted Co., Pittsfield, Mass., has resigned. His successor is Louis Schaffer.

Wm. E. Phillips has accepted the position as overseer of weaving at the Wassookeag Woolen Co., Dexter, Me. He was formerly employed as cloth inspector at the Robert Dobson Co., Pittsfield, Me.

Wm. H. Bagley has been appointed agent of the Saranac Mill, American Woolen Co., Blackstone, Mass. He was formerly engaged as agent of the Cocheco Woolen Mfg. Co., East Rochester, N. H.

Rudolph Mueller has been appointed overseer of finishing at the Lacon Woolen Mill, Lacon, Ill. He comes from the Ashtabula Worsted Mill, Ashtabula, O.

R. G. West, overseer of weaving at the Akers & Taylor Mfg. Co., Charlton City, Mass., has resigned.

E. H. Harrison has accepted the position as overseer of spinning at the Jeffrson Yarn Mill, Jefferson, Wis. He comes from Racine, Wis.

Harris Midwood has accepted the position as overseer of finishing at the Saxton's River Mill, Saxton's River, Vt.

John Paisley, for the past forty-five years overseer of bleaching at the Pacific Mill, Lawrence, Mass., has severed his connection with that company. Mr. Paisley came to Lawrence from Scotland in 1866 at the age of 23 years and shortly after arriving here started in the color room of the old Pacific Mill.

Frank B. Ricketson, agent of the Burgess Mill, Pawtucket, R. I., has resigned to accept a similar position with the Ponemah Mill, Taftville, Conn.

Richard B. Snow has been appointed agent of the Burgess Mills, Pawtucket, R. I., to succeed Frank B. Ricketson.

W. A. Mitchell, for the past year superintendent of the Massachusetts Cotton Mills, Lowell, Mass., has been appointed agent.

W. S. Southworth, agent of the Massachusetts Cotton Mills, Lowell, Mass., has severed his connection with that company. He has been in the employ of this concern for a great many years.

James H. Hendry, designer at the Jewell Brook Woolen Co., Ludlow, Vt., has severed his connection with that company.

C. H. Ammick, overseer of weaving at the Apalche Mill, Arlington, S. C., has resigned.

B. W. Bingham, assistant superintendent at the Lockmore Mills, Yorkville, S. C., has resigned to accept the superintendency of the Marcia Yarn Mills, which have been reorganized at Crouse, N. C.

G. D. Barlow, superintendent of the mills at Dillon, S. C., will also be superintendent of the Hamer Cotton Mills, Hamer, S. C.

J. B. Coley has accepted the position as overseer of weaving at the Bellwill Mills, Wilmington, N. C.

W. A. Stone has accepted the position as overseer of spinning at the Sheldon Cotton Mills, Sheldon, N. C. He comes from Marion, N. C.

Charles Whitmeyer has accepted the position as assistant superintendent of the Holston Mfg. Company, Lenoir City, Tenn. He comes from Philadelphia, Pa.

George R. Paige has accepted the position as overseer of carding at the Ottaquechee Woolen Co., Evarts, Vt. He comes from Franklin, N. H.

M. J. Shaughnessey has accepted the position as superintendent of the Malone Woolen Mill, Malone, N. Y., succeeding G. A. Wilson. Mr. Shaughnessey was formerly employed at Oella, Md.

Peter S. Bauer has resigned his position in the New York office of John N. Stearns & Co., and has accepted the position as superintendent of the Paragon Silk Co., Paterson, N. J.

Robert Wild, overseer of weaving at the Hamilton Woolen Co., Amesbury, Mass., has been appointed superintendent of the same company to succeed Wm. S. Hume.

Thomas B. Smith, overseer of dyeing at the Hoosac Worsted Mills, North Adams, Mass., has severed his connection with that company. He is succeeded by Thomas F. Crofwell who comes from Providence, R. I.

Marriott Armitage, overseer of the Brussell department at the Hartford Carpet Corporation, Thompsonville, Conn., has severed his connection with that company after twenty-five years of service. He is succeeded by Albert F. Baker.

Albert Rhodes has accepted the position as designer at the Sherriffs Worsted Co., Fitchburg, Mass. He was formerly engaged at the Perseverance Worsted Co., Woonsocket, R. I., but more recently with the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass.

Edward F. Dudley has been appointed overseer of weaving at the Atlantic Mills, Stottville, N. Y. He comes from Pittsfield, Mass.

B. M. Rose has been appointed superintendent of the E. N. Holt Plaid Mill, Burlington, N. C.

Edward J. Briggs has accepted the position as overseer of worsted drawing at the Monomac Spinning Co., Lawrence, Mass. He was formerly employed at the Alsace Worsted Co., Woonsocket, R. I.

J. H. Redmond has been appointed superintendent of the Faulkner Co., North Billerica, Mass. He comes from the Hoosac Worsted Mill, North Adams, Mass.

Jno. W. Clevette has been appointed overseer of weaving at the Beaver Brook Mills, Collinsville, Mass. He was formerly engaged at the Victor Mfg. Company, Clinton, Mass.

Esidore Lacasse has accepted the position as second hand in the dye house at the Shetucket Company, Norwich, Conn.

Jno. J. McAuliffe, Jr., has accepted the position as general second hand of carding at the Grant Yarn Mill, Fitchburg, Mass. He was formerly employed at Easthampton, Mass.

C. H. Cole, superintendent of the Entwistle Mills, Rockingham, N. C., has resigned.

L. E. Beckom has accepted the position as overseer of the drawing-in at the Patterson Mills,

Roanoke Rapids, N. C., having resigned his position with the Pomona Mills of Greensboro, N. C.

D. Ramseur has accepted the position as overseer of carding at the Lockmore Mills, Yorkville, S. C.

N. H. McGuire, from the Pacolet Mill, No. 4, New Holland, Ga., has accepted the position as overseer of weaving with the Milfort Mill of Fort Mill, S. C., succeeding T. G. Moser, who has resigned.

Samuel L. Dean, overseer of dressing at the Nashawena Mill, New Bedford, Mass., since its establishment and who for several years was prominently identified with the mill business in New Bedford, has been appointed superintendent of weaving at the Jenckes Spinning Co., Pawtucket, R. I.

F. H. F. Ballou has accepted the position as overseer of finishing at the Ashtabula Worsted Mill, Ashtabula, O. He comes from the James & E. H. Wilson Mill, Pittsfield, Mass.

O. L. Dunton, master mechanic at the Hoosac Cotton Co., North Adams, Mass., has severed his connection with that company.

Charles W. Thomason has accepted a position with the Bigelow Carpet Co., Clinton, Mass. He was formerly employed as overseer of the worsted spinning department at the Hartford Carpet Corporation, Thompsonville, Conn.

George H. Thomas, overseer of carding at the Robert Dobson Co., Pioneer Woolen Mills, Pittsfield, Me., has resigned.

E. Halsell has accepted the position as overseer of carding at the Warren Cotton Mill, West Warren, Mass. He was formerly carder at the Hamilton Mfg. Company, Lowell, Mass.

Joseph Harrison, superintendent of the worsted yarn department at Edward T. Steel & Co.'s mill, Britol, Pa., has resigned. His successor is John S. Hoyle of Providence, R. I.

Wm. Hodgson, designer at the Sherriffs Worsted Co., Fitchburg, Mass., has severed his connection with that company.

C. L. Taylor, overseer of spinning at the Riverside Mills, Anderson, S. C., has resigned. He has accepted a similar position at the Hartwell Mills, Hartwell, Ga.

W. M. Burden has resigned as overseer of spinning at the Georgia Cotton Mills, Dublin, Ga.

J. D. Bacon, superintendent of the Jennings Cotton Mill, Lumberton, N. C., has resigned.

R. T. Grant of the Anderson Cotton Mills, of Anderson, S. C., is now filling the position with those mills as overseer of weaving in Nos. 1 and 2 mills.

Clarence Willis, overseer of weaving at the Walhalla Mills, Walhalla, S. C., has resigned.

S. G. Dover, overseer of carding at the Ide Mills, Jacksonville, Ala., has resigned.

H. Y. McCord has been elected president of the Aldora Mills, Barnesville, Ga. He comes from Atlanta, Ga.

W. P. Holt, general manager of the Hope Mills Mfg. Co., Hope Mills, N. C., has resigned and is to accept a position as vice-president and general manager of the Holt Granite Mills, Haw River, N. C.

W. E. Tisdell, from Rutherfordton, N. C., succeeds P. M. Keller as overseer of carding and spinning at the Dilling Mill, King's Mountain, N. C.

P. M. Keller, who has been overseer of carding and spinning at the Dilling Mill, King's Mountain, N. C., has accepted the position as superintendent of the Jennings Mill, Lumberton, N. C.

John A. Waugh has resigned as second hand in the carding department at the Chicopee Mfg. Co., Chicopee Falls, Mass., to accept a similar position with the Berkeley Company, Berkeley, R. I. He is succeeded at the Chicopee Mfg. Company by John Gaynor from the Boston Mfg. Co., Waltham, Mass.

Walter A. Clark, treasurer and manager of the Franklin Felt Co., Franklin, Mass., which concern was recently purchased by the American Felt Co., has resigned.

David Waugh has accepted the position as overseer of carding at B. B. & R. Knight's mill, White Rock, R. I. He was formerly employed at the Berkeley Company, Berkeley, R. I.

Curtis Randolph, general manager and treasurer of the Ashaway Line & Twine Co., Ashaway, R. I., has severed his connection with that company. He is to assume the position of treasurer of the Alfred University, Alfred, N. Y.

Joseph Wright has accepted the position as overseer of finishing at the Valentine-Bentley Silk Co., Newton, N. J.

E. M. Main, overseer of weaving at the Courtenay Mfg. Co., Newry, S. C., has resigned.

Wm. T. Waterhouse has accepted the position as overseer of carding at the Yantic Woolen Company, Yantic, Conn. He comes from the Oak Valley Mill, Tarklin, R. I.

Carl R. McDougall has accepted a position in the combing and spinning departments of the Saxony Worsted Mill, Newton, Mass. He comes from Fulton, N. Y.

John C. Kollett has accepted the position as master mechanic at the Adams Mfg. Company, Shelton, Conn. He comes from Woonsocket, R. I.

M. J. Boland has accepted a position as overseer of dyeing at the Great Falls Woolen Company, Somersworth, N. H. He comes from Worcester, Mass.

John Eyers has accepted the position as overseer of finishing at the Great Falls Woolen Co., Somersworth, N. H. He comes from Rockville, Conn.

John S. Hoyle has accepted the position as superintendent of the worsted yarn department at the Edward T. Steel & Co.'s mill, Bristol, Pa. He was formerly employed at the Steere Worsted Mill, Providence, R. I.

Charles E. Johnson has accepted a position as overseer of carding at the Brampton Woolen Co., Newport, N. H. He comes from Ludlow, Vt.

George W. Merrow has accepted the position as second hand in the carding department at the Hamilton Company, Lowell, Mass.

George Taylor has been appointed overseer of spinning at the Great Falls Woolen Co., Somersworth, N. H. He comes from Winooski, Vt.

George Moore, overseer of spinning at the Great Falls Woolen Co., Somersworth, N. H., has been promoted to the position of assistant superintendent.

David Abeel has accepted the position as overseer of the winding, knitting, cutting, finishing and shipping departments at the Sterling Mill, Ilion, N. Y.

A. Saunders, overseer of dyeing and bleaching at the Chipman Knitting Mill, Easton, Pa., has severed his connection with that company.

John Haggerty, overseer of the finishing department at the Victor Knitting Mill, Cohoes, N. Y., has resigned to accept a similar position at the Union Mill, Herkimer, N. Y.

Walter L. Angell has been appointed overseer of dyeing at the Aetna Hosiery Co., Worcester, Mass. He was formerly employed at the Waucantuck Mills, Uxbridge, Mass.

D. C. Collier has been appointed vice-president and general manager of the Oxford Knitting Mill, Barnesville, Ga.

Charles E. Haines, formerly superintendent of the Grant Mills, Providence, R. I., has been appointed superintendent of the Royal and Valley Queen Mill at Riverpoint, R. I., succeeding Harry K. Drew.

DEATHS.

Gilbert J. Carter, a well known woolen manufacturer of Tilton, N. H., died suddenly at the home of Millard Emery. He was born in Barnet, Vt., 71 years ago and for thirty years was superintendent of the Bigelow Carpet Mfg. Co. of Clinton, Mass. He was a veteran of the Civil War and a brother of A. D. Carter of Tilton. Mr. Carter is survived by a widow, two sons and two daughters.

John Dobson, a wealthy carpet manufacturer of Philadelphia, died at his home in that city from the result of a fall down a flight of stairs, his advanced age counting against his chance for recovery, he being 84 years at the time of his death. He was born Oct. 9, 1827, in Malton, Yorkshire, Eng., coming to this country in 1848. His career as a manufacturer began in a humble way, first manufacturing banding and twine. He later associated himself with James Lees in West Manayunk and began the manufacture of woolen yarns. Afterwards he started in the manufacture of blankets and soon built the large Falls of Schuylkill Mills where thousands of operatives were employed. He was a member of the Episcopal Church and is survived by a daughter, Mrs. Elizabeth Riddle of Glen Riddle, Pa.

Herbert Terry, of the Terry Hosiery Co., Reading, Pa., and one of the leading manufacturers of that city, died at the age of 57 years.

Geo. F. Moore died at his rooms in Hotel La-Tourette, Bayonne, N. J. Mr. Moore had been associated with R. G. Dunn & Co. for twenty-eight years and is survived by a widow and one son. He was well known to the textile trade, having been connected at one time with the firm of Dimick & Moore.

Wm. Smith, master mechanic at the Washington Mill, American Woolen Co., Lawrence, Mass., for the past 26 years, died at his home in Lawrence at the age of 58 years. He is survived by a wife and two children.

George Follett, for the past two or three years associated with his son, Albert Follett, died at his home in Brooklyn, N. Y., June 6. Mr. Follett was one of the oldest men engaged in the woolen business in this country. He was 83 years of age.

Frederick A. H. Ballou, superintendent of the Assabet Mill, Maynard, Mass., and for a number of years at the Brown Mill, Dover, Me., died at Saranac Lake in the Adirondacks on May 6th after a brief illness. He leaves a widow and one daughter.

James L. Ashton, overseer of carding at the Griswoldville Woolen Mill, Griswoldville, Mass., died at his home. He is survived by a widow and six children.

Samuel E. Hull of Millbury, Mass., dealer in wool waste, died at his home in that town after a brief illness.

George W. Burr died at his home in Genoa, Ark. Mr. Burr was a woolen finisher by trade and was considered a very capable man. He had worked in a number of the leading mills of New England but gave up mill business about three years ago to take up farm life in the West. He purchased a small farm in Genoa, Ark., where he has resided ever since. He was a member of the National Association of Wool and Worsted Overseers and was secretary of the beneficiary department for a great many years. Mr. Burr was born in 1846 at Great Barrington, Mass., where his remains were brought for interment.

Frank H. Amback died at his home in Newburyport, Mass., at the age of 75 years. Mr. Amback was for twenty-four years superintendent of the Robert Bleakie Co.'s mill at Hyde Park, Mass., and was also employed at the Hamilton Woolen Co., Amesbury, Mass., and the Orumbo Mills, Lisbon Falls, Me. He was a Mason and a member of I. O. O. F. He is survived by a widow and five children.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

.....

New Mills.

Rhode Island, Pawtucket. A plant will be located at Attleboro, near the Pawtucket line, by the Crown Mfg. Co., a new corporation chartered with capital of $500,000. Three acres of land will be occupied, this tract being located just beyond the Home Bleach & Dye Works and having a frontage on the India Point branch railroad, so that there will be ample railroad facilities. Lyman B. Goff, president of the Union Wadding Co., will be president of the new concern. Kenneth F. Wood, Mr. Goff's son-in-law, and superintendent of the Sayles Bleacheries, will probably be vice-president, and Edward E. Leonard, treasurer. Benj. C. Chace, Jr., is to be general manager. The exact nature of the goods to be produced has not been stated definitely, but according to reports the company is to manufacture and develop specialties in yarns originated by Mr. Chace and greatly developed by him the past year since his resignation as superintendent of the Samoset Co., Valley Falls. Plans have been prepared by Engineer Judson of Pawtucket and call for a brick mill.

*South Carolina, Greenville. J. Adger Smyth, Jr., president and treasurer of the new Duncan Mills, reports that he expects the new plant will be producing goods January 1, 1912. Work was started on buildings May 15 and satisfactory progress has been made to date. This is a $1,000,000 company, incorporated to manufacture fancy cotton goods from combed yarns on 51,000 ring spindles and 1,200 looms. Ellison A. Smyth is vice-president and T. B. Wallace will be superintendent. J. P. Stevens & Co. will sell the product.

*Texas, Waco. Subscriptions to stock of the new Waco Cotton Mill Co. have been very satisfactory to date and the outlook is promising for the location of the mill here. This is a 5,000-spindle twine mill project promoted by the Central Texas Finance Co. E. F. Drake, secretary of the Business Men's Club, heads the project.

*Vermont, Brattleboro. The Fort Dummer Mills are planning to complete the equipment of their new plant and begin the production of goods by November. They will have 35,000 ring spindles and 650 looms for making 60s to 100s yarns and weaving them into fine lawns. The machinery will be electrically driven throughout. Geo. L. Dunham has been elected president; Edw. G. Chace, Providence, treasurer and buyer.

*Virginia, Alta Vista. It is estimated the Alta Vista Cotton Mill Co. has completed about 50 per cent. of construction on its plant. Since the election of new officers it has been decided to complete the remainder by August. The main building is to be 127 by 350 ft., half of it being 2 stories high for the carding and spinning departments and half 1 story high for weaving. The machinery will include 12,800 spindles and 292 looms. John E. Lane is president and treasurer; R. L. Cumnock, vice-president and general manager, and A. G. Bell, secretary.

.....

Enlargements and Improvements.

Alabama, Anniston. It has been decided to make the reported improvements at the Anniston plant of the American Net & Twine Co. The company will build an addition to the main building, a new warehouse, 60 by 300 ft. will be constructed, also 20 cottages for operatives. New machinery will be installed to double the present capacity of the plant, now operating 10,000 ring spindles.

Georgia, Atlanta. The Gate City Cotton Mills have awarded contract for 4 additional cards, 2 speeders and other preparatory equipment.

Georgia, Atlanta. Improvements are being made in the card room of the Exposition Cotton Mills. A new card stripper is being installed and if satisfactory about $17,000 will be expended in equipping the entire card room with this device.

*Georgia, Barnesville. At a meeting of stockholders of the Aldora Mills plans to change the product of the mill from cotton yarns to woven goods and to erect a 2-story brick mill, 100 by 240 ft., to be equipped with looms, were ratified. It is the purpose of the management to have the new mill ready for operation by the time the new cotton crop is harvested. At a meeting of directors, H. Y. McCord of Atlanta was elected president, filling the vacancy caused by the resignation of T. D. Stewart. F. N. Inman of Atlanta was reelected secretary and treasurer, and R. E. Hightower, vice-president and manager. As noted previously, the enlargements and improvements to be made will cost approximately $150,000 and include changing from steam to electric power, obtained from the lines of the Central Georgia Power Co.

*Georgia, Carrollton. Construction work will be started at once on the previously reported additions to the Mandeville Mills and new equipment which includes 10,032 spindles to make 8s yarns from waste stock, 16s to 30s single and ply yarns on cones and tubes and 2/20 and 2/30 chain warps will be installed by Oct. 1. J. A. Mandeville is manager and buyer. In connection with this increase the capital has been increased to $500,000.

*Georgia, Columbus. The two additions being built for the Swift Mfg. Co. are for the dye house and picker house buildings. They have not decided what extra machinery will be put in, but some increase will be made as the facilities in these

two departments have been outgrown. Harry L. Williams is president; Rhodes Browne, vice-president, and John T. Abney, secretary and treasurer.

Georgia, Dallas. The Paulding County Cotton Mfg. Co. will install electric power equipment and obtain power from the recently completed hydro-electric plant of the Paulding County Power Co.

Massachusetts, Chicopee. The new No. 1 Mill of the Dwight Mfg. Co., now under construction, will be equipped with the machinery now in mills No. 1 and 2, and the latter buildings will be torn down. A part of the ground now occupied by mills No. 1 and 2 will be needed for the new mill, so it will be necessary to remove the machinery from the old buildings and tear them down before the new mill is wholly completed. It is expected the work will be far enough ahead to transfer machinery from mills 1 and 2 by October 1.

*Massachusetts, Fisherville. A force of men is engaged in removing the card room machinery of the Fisher Mfg. Co. to the new addition.

*Massachusetts, Fitchburg. The small 3-story addition to be built by the Grant Yarn Co. is to relieve the present overcrowded condition and they do not expect to purchase anything new in the way of machinery or power equipment.

*Massachusetts, Lowell. Contract has been awarded for the erection of the new mill for the Hamilton Mfg. Co. Plans were announced in May.

New York, Cohoes. An auxiliary electric power plant is being equipped by the Harmony Mills which will generate 2,000 h. p.

North Carolina, Charlotte. A new office building is to be erected by the Chadwick-Hoskins Co. at a cost of about $10,000.

*North Carolina, Charlotte. Fifty wide looms for weaving damask have been installed by the Fidelity Mfg. Co. If the new department is successful more looms will be added and the product will gradually be withdrawn from sale yarns.

North Carolina, Dallas. One card and 4 spinning frames will be added to the equipment of the Monarch Cotton Mills.

*North Carolina, Double Shoal. Work is to be started as early as possible on improvements at the water power plant of the Double Shoal Cotton Mills. James Leffel & Co. of Springfield, O., are the engineers in charge.

*North Carolina, Lincolnton. The Eureka Mfg. Co. has installed the new cards and other equipment mentioned in March.

*North Carolina, St. Pauls. The St. Pauls Cotton Mill Co. will increase the output 36 per cent. and contracts have been awarded for 4 cards, 1,940 spindles, 2 speeders and 72 winding spindles. They hope to have this new machinery installed by September 1. L. Shaw is president; A. R. McEachern, treasurer, and A. L. McDonald, superintendent.

Pennsylvania, Philadelphia. Whiteley & Collier, who were burned out at 55th and Girard Ave., where they manufactured upholstery goods with 21 looms, have leased a portion of the Oriental Mills at 55th and Wyalusing Ave., a short distance from their old location, in which they have installed new equipment. They are again in full operation.

Pennsylvania, Philadelphia. The Philadelphia Tapestry Mills have recently placed a contract for the erection of a new one-story concrete weave shed, 186.2 by 156.2 ft., at a cost of $35,000. Work will be started at once.

Rhode Island, Pawtucket. No. 4 Mill of J. & P. Coats, Ltd., will be shut down for about six weeks while electric power equipment is installed. The main shaft in this mill was broken last week and it was found necessary to close. The twisting room will be run as much as possible in order that the finishing department may not be crippled, but the card rooms and mule rooms will be closed.

South Carolina, Greers. Bids have been received for the construction of an addition to the Greers Mfg. Co., one of the plants controlled by the Parker Cotton Mills Co. of Greenville, and contract will be awarded in a short time. In April the capital stock was increased from $200,000 to $311,000. 10,200 ring spindles and 280 looms are operated at present on print goods.

*South Carolina, Pickens. The addition of 1,000 spindles to the equipment of the Pickens Mill, reported last week, will be made as early as possible. No other changes are contemplated at the present time.

*South Carolina, Spartanburg. Purchase of the new machinery equipment to be installed by the Saxon Mills, including 2 pickers, 6 cards, 2 roving frames and 2 spinning frames has not been made. It was previously reported that contracts had been awarded.

*Texas, Cuero. The capitalization of the new Guadalupe Valley Cotton Mills has been fully decided, but will probably be about $125,000. The officers will be as follows: J. C. Saunders, president; W. M. Ratcliffe, vice-president; S. C. Lackey, vice-president; Joseph Sheridan, secretary and treasurer and J. L. May, superintendent. The plant will contain 7,000 spindles and 160 looms and will manufacture duck and heavy sheetings when the improvements now under way are completed and will sell the product direct. The mill is not running at present as improvements are being made which include the construction of an addition, 60 by 150 ft., to the main building.

*Texas, Huntsville. The board of prison commissioners has awarded contract for additional machinery, including 20 looms and yarn preparatory machinery. The prison mill is operated by convict labor on cloth for making towels, sheets, uniforms, etc., for the convicts.

.....

Mills Shutting Down.

Pennsylvania, Philadelphia. The Standard Mills, operated by Jos. N. Derk & Co., at Indiana Ave. and A St., where they manufacture draperies and

curtains on 30 looms, are reported as about retiring from business, the plant to be shut down July 1. Mr. Derk will give his entire attention in the future to the Bell Hosiery Co., at Mascher and York Sts., of which he is the president and buyer.

WOOLEN.

.....

New Mills.

Pennsylvania, Lansdale. Wm. T. Scott, formerly with the Kilmarnock Textile Co., Philadelphia, and other parties in this town, are equipping a plant at 3d and Walnut Sts. with 6 looms and auxiliary machinery for the manufacture of a line of Scotch fabric rugs. The company will be known as the Kinloch Rug Co. A new brick and frame mill, 250 by 100 ft., has been purchased and will be equipped in time to begin operations by July 1 if present plans are followed. Mr. Scott will be manager of the plant.

.....

Enlargements and Improvements.

Connecticut, Glenville. A new set of cards has been ordered for the local plant of the American Felt Co.

*Massachusetts, Lowell. The Bigelow Carpet Co. has made application for permit to build the proposed new dye house mentioned some time ago which will be known as No. 17 Mill. It will be 277 ft. long and 46 ft. wide of brick, steel and concrete construction. This will complete the work of replacing the old structures with modern buildings which has been going on for several years.

*Massachusetts, Marlboro. Machinery is arriving for the National Wadding Co., formerly of Charlton. As noted, the building formerly occupied by the Marlboro Shoe Co. has been purchased.

Massachusetts, Plymouth. A new water wheel is being installed by the Standish Worsted Co.

New York, Amsterdam. Plans are being prepared for a new concrete warehouse and storehouse at Rockton for McCleary, Wallin & Crouse, manufacturers of rugs in this city. The dimensions called for are 700 by 80 feet and the work will be started at once and pushed forward to completion as speedily as possible.

Pennsylvania, Bristol. Work has been started on an addition to the Bristol Worsted Mills of W. H. Grundy & Co., which will be 38 by 168 ft., 3 stories high, of concrete and steel construction.

Pennsylvania, Philadelphia. The Penn Worsted Co., who recently purchased the mill building at Jasper and York Sts., report that they will be unable to remove to their new location until after the 1st of December. They have installed machinery in the Jasper St. mill, which is in operation in addition to their old plant at Mascher & Oxford Sts.

*Tennessee, Springfield. The Springfield Woolen Mills Co. has built the addition recently noted and installed new equipment which gives a total of 4 sets of cards and 48 looms. All wool blankets are manufactured.

Virginia, Laurel Mills. It is reported the Rappahannock Woolen Mills Co., will rebuild its plant recently burned with loss of $10,000. Kerseys, cassimeres and woolen yarns were manufactured on 1 set and 7 looms. F. B. Dudley is treasurer, superintendent and buyer.

.....

Mills Starting Up.

Canada, Ontario, Almonte. A new company has been organized nuder the style of R. W. Lee, Ltd., to take over and operate the plant of the late R. William Lee. Four sets of shoddy cards, 1 garnett and 2 pickers are being operated and the concern also carbonizes for the trade.

Kansas, Topeka. It is expected the Western Woolen Mill Co. will reopen July 1 after an idleness of several weeks on account of the dull season.

Massachusetts, Spencer. Dufton Bros. have leased the spinning department of the Priscilla Mill and will manufacture yarns for their own plant known as the Westville Mill.

KNIT.

.....

New Mills.

Canada, Ontario, Hamilton. W. H. Magill, Royal Hotel Bldg., Hamilton, with others, is incorporating a company to manufacture knitted underwear.

*Connecticut, Hartford. Repairs will be made at once by the Hygrade Mills, whose knitting plant was recently damaged by fire.

*Indiana, Goshen. The Rock Run Mills will be incorporated with capital stock of $75,000 by W. L. Stephenson, D. K. Stephenson and W. L. Stonex, who will be the officers and directors. This new corporation will equip the mill in Goshen, previously reported as a branch of the Stephenson Underwear Mills of South Bend. W. L. and D. K. Stephenson are sons of B. C. Stephenson, secretary and treasurer of the Stephenson Underwear Mills, and have been connected with the South Bend plant as salesman and assistant superintendent respectively. Mr. Stonex is a lawyer of Goshen, and a life-long friend of B. C. Stephenson. The new plant will produce fine gauge flat-web men's underwear and in addition to knitting machinery will have 2 sets of wool cards and 1,200 spindles. The old rubber works plant has been secured, as noted, and a brick addition, 68 by 100 ft., 2 stories high, will be built of mill construction and fitted with automatic sprinklers. W. L. Stephenson will be president and D. K. Stephenson, treasurer and superintendent. The product will be sold direct. The machinery will be driven by steam and electric power. This is a movement to establish the younger Stephensons in the underwear business and the organization of the new company and the location at Goshen is the direct outgrowth of the mistreatment of the Stephenson Underwear Mills by the City administration at South Bend, as noted previously. Soon after July 4, B. C. Stephenson, secretary and treasurer, and

G. M. Hewittt superintendent, of the Stephenson Underwear Mills, will come East on a machinery buying trip.

Indiana, South Bend. The Stephenson Underwear Mills will spend $25,000 on improvements, including the building of a retaining wall, 240 ft. long, and the erection of a 1-story brick and concrete power house, 40 by 60 ft., to be equipped with two 54-in. water wheels producing 300 h. p. Contracts have been placed and the work is now in progress.

*Maryland, Hagerstown. Good progress has been made on the erection of the small knitting mill for Geo. A. Zook, but it will be perhaps September 1 before everything is in readiness to begin manufacturing. The product will be ladies' knit underwear made from combed yarns, 15 to 18s counts. Mr. Zook attends to the buying personally and will manage the plant. Employment will be given to about 25 hands.

Massachusetts, Taunton. On July 1 the manufacture of half hose of fine Sea Island yarns will be started in a plant on Howard St. by a new concern known as the Lockstitch Hosiery Co., employment being given to 6 hands. The equipment consists of 6 knitting machines, 1 ribber and 1 looper operated by electric power. C. H. Lawrence is agent and buyer and S. C. Maloy is superintendent.

New Jersey, Wharton. For the past year M. Munson Searing, of the Singleton Silk Mfg. Co., has been experimenting with the manufacture of mercerized and silk seamless hosiery. He has now begun to manufacture commercially under the style of the Wharton Textile Co. and is employing 12 hands. J. Allen Crews is superintendent and buyer of cotton yarns. Mr. Searing buys the silk.

New York, Broadalbin. At a meeting of the Broadalbin Knitting Co., Ltd., it was shown that the business for the past 5 months was an increase in volume of 30 per cent. over a similar period in any preceding year. During this time an addition, 40 by 60 ft., has been built and it is now being equipped, while a storehouse of concrete construction, 42 by 72 ft., is being erected opposite the main mill building. The storehouse will be completed and ready for occupancy about July 15. The regular semi-annual dividend was declared. Henry C. Finch is president and treasurer, and B. C. Smith, secretary and manager. Cotton, wool and merino men's fleece lined and flat underwear, jersey cloth and fleece linings are manufactured on 6 sets wool cards, 40 spring needle and 11 flat knitting and 80 sewing machines.

New York, New York City. The Queen Braid Works, M. Summerfield, proprietor, 415 West Broadway, has moved to 227 West 17th St., where larger quarters have been secured, allowing of an increase in the machinery equipment.

*New York, Watertown. The new mill of the Shaughnessy Knitting Mills is practically completed, and the work of moving machinery from the present quarters has been started. As noted in earlier reports, some new knitting machinery will be added, also a dyeing department. The new mill is 3 stories high, 50 by 140 ft., and is being built at an expenditure of $50,000. The present quarters are on the second floor of the Wise Bldg., where this concern started about two years ago, removing here from Amsterdam. A marked success has been made and improvements, enlargements and increases were made from time to time until the present quarters were entirly inadequate to take care of the growing business.

Ohio, Cleveland. A new concern known as the Forest City Knitting Co. has established a plant at 4345 West 35th St. and is manufacturing sweaters, gloves, hosiery and fancy knit goods. Fifteen knitting machines have been installed and are operated by electric power. C. Hendrich is manager.

Pennsylvania, Bangor. A new company to be known as the Bangor Silk Knitting Co. in which H. M. Hagerman and E. Phillip Keenan of this place are interested may establish a plant here. It is reported an attempt will be made to secure a lease on the unoccupied part of Music Hall until a mill can be erected. The initial capital stock is to be $5,000 and this is to be increased as the business grows. Later in the month application will be made for a charter.

*Pennsylvania, Philadelphia. The Henry Lemuth Company, with a capital of $100,000, Henry Lemuth, Jr., president, Geo. Lemuth, secretary and treasurer, and Oscar Nebel, superintendent, located at Ontario and D Sts., is now installing machinery which consists of 12 full fashion frames, 18-section machines. This equipment is to be operated on 42 and 45-gauge ladies' fine full fashion silk hosiery, using 2/50, 2/60 and 2/120 mercerized yarns and 4, 6, 7 and 8 thread silk. The product is to be finished and sold direct.

Pennsylvania, Bloomsburg. Work has been started on a large addition to the Bloomsburg Hosiery Mills, manufacturers of men's and women's seamless and children's hosiery. Earlier in the year it was reported that the Bloomsburg Hosiery Mills would take over the Montour Knitting Mills Co. at Catawissa, but the latter company has been reorganized and is now in operation.

Pennsylvania, Philadelphia. Harry Richter, at one time in business at 26 N. 3d St., has recently purchased four knitters, which he has removed to his home on Moyamensing Ave., his idea being to start up a plant for the manufacture of sweater coats during the coming fall.

Pennsylvania, Philadelphia. The Eastern Knitting Mills, with Casten & Bogen as proprietors, both of whom were formerly connected with the Pennsylvania Knitting Mills of this city, have leased the fourth floor of the building at 110 Arch St., which they will equip with machinery for the manufacture of sweater coats. Four knitters have been ordered and will be delivered the middle of this month. Electric power will be used.

Pennsylvania, Philadelphia. H. W. Clay, 2240 Orkney St., who is now operating one knitter on experimental work, will equip a plant for the manufacture of ladies' 188-needle seamless cotton hosiery.

*Virginia, Suffolk. Work is to be started at once on a mill building for the Carr Mills and they hope to begin the manufacture of hosiery with 30 machines about August 1. Fine gauge men's and ladies' goods will be made from yarns ranging from 2/34s to 2/70s mercerized and 1/50s to 1/80s combed. The plant will be operated by electric power and all the equipment will be new. As noted, this company was incorporated a week ago with capital stock of $50,000. G. L. Bell has been elected president; E. A. Everett, treasurer, and J. O. Carr, manager and buyer. Other men interested are C. J. Dennis, T. A. Holliday, W. T. Johnson, James E. Burgess, T. A. Barber, C. M. Kilby, T. Lipman, J. B. Pinner, John King, W. S. Cross and Hugh L. Holland.

.....

Enlargements and Improvements.

*Illinois, Champaign. Work is progressing rapidly on the mill for the Textile Mfg. Co. of Chicago. The brick walls are up and the roof will be put on shortly. This is to be a branch of the plant at 213 Institute Pl., Chicago.

*New Jersey, Camden. Seven knitting machines for making Shaker sweaters have been installed by the Highland Worsted Mills. Heretofore this concern has manufactured only fine worsted yarns on the Bradford system. John A. Bottomley is treasurer and buyer.

New York, Elmira. A new filtration plant has been added to the facilities of the Campbell Knitting Mill Co. and hereafter instead of using city water, which has been found unsatisfactory for bleaching purposes, the mill will use water from Newtown Creek.

New York, Oswego. An addition, 40 by 75 ft., is to be built for the Lastlong Underwear Co. and will be equipped as a bleachery. It is to be completed in from eight to ten weeks. Only recently this company completed its new mill at a cost of $50,000 and transferred the machinery from the old plant. Cotton summer underwear, 24, 28 and 36-gauge is manufactured. H. A. Baker is president; K. H. White, treasurer and superintendent.

Ohio, Toledo. The capital stock of the Dolphin Hosiery Co. has been increased from $10,000 to $20,000 and some increase will be made in the capacity of the plant.

*North Carolina, Durham. It is understood that repairs will be made by the Chatham Knitting Mills Co., whose plant was damaged to the extent of about $25,000 by fire, as noted. The insurance was $15,000. The building was saved from total destruction and the damage to machinery was largely by water. Eighty latch needle knitting machines were operated on seamless half hose. J. H. Stone is president and superintendent and W. T. Cole, treasurer and buyer.

Pennsylvania, Easton. An addition of 30 knitting machines and 1 winder has been made by the Easton Knitting Mills Co. This concern has been very successful since beginning manufacturing about a year ago and now has 115 knitting machines operating on women's hosiery. O. Paul Kaffke is manager, secretary and buyer. A. J. Bowers is president, and Bertram S. Reading is treasurer.

Pennsylvania, McVeytown. The Allensville Hosiery Mills are about to install a finishing plant for half hose. V. A. Zerby is president; Harry L. Hubbs, secretary and treasurer, and C. C. Fisher, superintendent. They make men's and women's hosiery, 176 and 200-needle goods, operating 32 knitting machines and 9 loopers by electric power. The Philadelphia office is at 5522 Irving St.

Pennsylvania. Philadelphia. Louis Engle & Bro., whose Lebro Knitting Mills are now located at 8th and Wallace Sts., where they manufacture sweater coats and crochet goods, with 10 flat knitters and 14 round frames, have put in additional machinery on which they are manufacturing a line of ladies' ribbed vests, etc. They are also arranging for the changing of some of their knitters over for making this line of goods in addition to sweater coats.

Pennsylvania, Philadelphia. The knitting mill of E. J. Aucott at 4947 Wakefield St., Germantown, which was burned several weeks ago, is being rebuilt and new machinery will be installed throughout as soon as the building is ready for occupancy. The business in the future will be conducted by the E. J. Aucott Hosiery Manufacturing Co., a limited partnership with a capital of $25,000. The plant before its destruction contained 120 knitters which were operated on men's and women's seamless cotton hosiery which was sold direct.

Pennsylvania, Philadelphia. Peter Dalalian, now operating two knitters on men's half hose and ladies' hosiery at 5241 Irving St., West Philadelphia, reports that he will install a number of new knitters and go into the business on a more extensive scale.

Pennsylvania, Philadelphia. The Progressive Knitting Mills, with a capital of $25,000, Elwood C. Matlack, president, and John Lundgren, treasurer, who started up a plant at Mascher St. and Lehigh Ave. the first of the year, with 20 knitters and 20 sewing machines on ladies', misses' and children's ribbed vests and union suits of cotton and mercerized yarns, are meeting with great success in the sale of their goods and are now about to double their equipment in order that they may be able to fill their orders. They sell direct through J. W. B. Carson, 444 Bourse Bldg., Philadelphia.

Pennsylvania, Philadelphia. The Actual Knitting Mills, located at 5126 Wakefield St., Germantown, which has been shut down for several months, has been removed to new quarters at 1631-33 Willington St., where it is just commencing to operate its machinery again on fancy knit goods, woolen and worsteds.

Pennsylvania, Philadelphia. The McKibban Hosiery Co., Inc., which removed from Royersford to 404 Brown St., this city, has again removed to larger quarters in the mill building at the N. W. corner of Mascher St. and Lehigh Ave. The com-

pany is reorganizing both as to officers and plant, the latter with a view of doubling its producing capacity. Men's, women's and children's hosiery and fancy knit goods of cotton, mercerized, silk and wool yarns are manufactured. J. G. McKibban is president and W. P. McClure is secretary and general manager.

*Pennsylvania. Reading. A total of 27,000 square feet will be added to the present capacity of the Berkshire Knitting Mills when the 2-story addition now under construction is completed. A large increase will be made.

Pennsylvania, Reading. The Terrey Hosiery Co. is installing 10 additional machines. Fine seamless cotton and mercerized half hose is manufactured.

Pennsylvania, Richland. A new boiler has been installed in the Richland Hosiery Mill, A. C. Haak, proprietor.

South Carolina, Montmorenci. The Hallman Knitting Mill Co. will sell $4,000 worth of stock to increase the capacity of the plant. Thirty knitting machines are now operated on men's, women's and children's hosiery. At the annual meeting a dividend of 8 per cent. was declared. C. E. Hallman is president, treasurer and buyer.

SILK.

.....

New York, Canisteo. New machinery for the Canisteo Silk Co. has arrived from France and includes 3 spinning frames, a winding machine and repair parts for the present equipment. The space now used for shipping will be filled up with machinery and it will be necessary to make some other provision for the shipping department. The plant is run 24 hours a day. The company does silk throwing.

New York, Hornell. Extensive alterations will be made to the plant of the Huguet Silk Co. this summer. According to plans, all changes will be completed by September 1. As noted several weeks ago, an addition has been constructed giving larger manufacturing space.

*New York, Kingston. At a meeting of the board of directors of the Mohawk Silk Fabric Co., there were submitted plans and specifications for the proposed new mill to be erected by the company at Kingston. Plans were prepared by Henry W. Grieme of Amsterdam and were accepted. They provide for a 2-story brick building of mill construction, 50 by 100 ft., in which a part of the Fultonville plant will be installed on completion, which will probably be September 1. The company does not propose entirely to dismantle or vacate its present quarters in Fultonville, but to continue that mill in operation as an auxiliary plant to the new mill. The main office will be located in Kingston. C. R. Morley, manager of the Mohawk Silk Fabric Co., has been in Kingston to make preliminary arrangements for the erection of the new mill and to place in the hands of the various contractors the plans and specifications of the building.

Pennsylvania, Coplay. More machinery is being installed in the Coplay branch of the Gallia Silk Mills and more hands will be employed. The warping, winding and weaving departments will be increased as fast as additional help can be secured. Large orders are on hand and steady work is insured in the Coplay Mill and in the main mill at South Bethlehem. C. M. Iarrow has recently been appointed superintendent.

*Pennsylvania, Dickson City. A total of 7,600 new spindles have been installed in the local plant of the Bliss Silk Throwing Co., modernizing this plant and bringing it up to the latest methods. 3,600 improved spindles have been installed in the North Scranton plant.

Pennsylvania, Philadelphia. The Pine Tree Silk Mills will take over another floor in the mill at Allegheny Ave. and Boudinot St. on July 1, when the Saxony Hosiery Co. moves to the Model Mills on Tioga St.

.....

Mills Starting Up.

Pennsylvania, Milton. Heinrich Klerx, general manager of the Susquehanna Silk Mills, confirms the report that the Sydney H. Souter Silk Co.'s

MISCELLANEOUS.

.....

Connecticut, Bridgeport. Alb. and E. Henkels, manufacturers of cotton and linen laces, are asking bids for the erection of a new weave shed to be of brick construction, 60 by 190 ft., 1 story high, with saw tooth roof. S. M. Green of Springfield prepared the plans.

*Connecticut, Bridgeport. Plans for the proposed new building of the Bridgeport Elastic Fabric Co., Inc., are now being drawn and will call for a mill 2 stories and basement, about 130 by 90 ft. It is their purpose to erect only part of it at the present time, however. The new mill will contain finishing department, stock and shipping rooms and a new office, and will also permit of the installation of new machinery equipment at a later date. Garter webbings and narrow elastic goods are made.

Maine, Lewiston. Work has been started on the proposed addition, 40 by 80 ft., to the Lewiston Bleachery & Dye Works. The erection of a new storehouse is planned.

Massachusetts, Fall River. The Crystal Springs Dyeing & Bleaching Co. has issued $150,000 in 30-year bonds. Albert L. Frost, treasurer and buyer, states that the business will be greatly extended. They are dyers, bleachers and printers of white goods, indigoes, etc. The New York office is at 60 Leonard St.

Massachusetts, Fall River. A new corporation known as the Fall River Webbing Mills has been formed for the manufacture of tapes, braids, webbing, corset lacings and hospital gauze and has purchased the plant formerly occupied by Hanscom Bros. The officers are John H. Estes, president;

J. T. Lincoln, vice-president; Alex. Simmons, treasurer, and Matthew Hanscom, superintendent. Among the directors are J. Edmund Estes, E. B. Estes and Rufus P. Walker. The corporation has capital stock of $40,000 and will employ probably 60 hands. Operations will be started June 26. A report states that the present plant is to be doubled as soon as is practicable, although all that is known definitely at the present time is that the old equipment will be started up next Monday.

Massachusetts, South Natick. The Boston Bedding Supply Co., whose plant was burned some time ago, is building a new mill and expects to begin manufacturing August 1. Cotton and woolen bats and shoddy are manufactured and the new plant will have the same equipment as the old one, that is, 8 pickers, 6 garnetts and 2 dusters. They will have water power and will install a dynamo. The capital stock is $25,000. W. K. Finkel is treasurer and N. Finstone, superintendent. The Boston office is at 110 Canal St.

Minnesota, Stillwater. An additional factory for making binder twine at the new State Prison is in operation, giving an increase of 125 spindles.

*New Jersey, Paterson. The addition being built to the Dundee Lake plant of the National Silk Dyeing Co. is under roof. This enlargement is for piece dyeing and printing and machinery will be installed within a few weeks.

New Jersey, Paterson. An addition, 50 by 50 ft., is being built to the embroidery mill of Geo. F. Owen & Co., 295 Vreeland Ave.

New York, New York City. A weave shed is to be built for the Kursheedt Mfg. Co.

Pennsylvania, Philadelphia. The plant of the Providence Mills Co., 55th St. and Girard Ave., which was burned out several months ago, is again in full operation, the damaged portions of the building having been repaired and new machinery installed. They bleach cotton and linen damasks and crashes.

Pennsylvania, Philadelphia. The Harvey Fibre Carpet Co., formerly David Harvey & Son, located at Janney St. and Allegheny Ave., where they are manufacturing fiber carpets and rugs on 50 looms, have contracted for the erection of a new power plant which will cost in the neighborhood of $22,000. The building will be one story, of brick, with stone foundations, 42 by 54 ft., 21 ft. high, with a lantern roof. A self-sustaining stack of stone, brick and steel will also be erected. A fire wall, 13 in. thick, will be erected between the boiler and engine rooms.

Pennsylvania, Philadelphia. A local builder has received a contract from the J. Milton Hagy Waste Works, for the erection of a new three-story factory building, 52 by 55 ft., and storage shed, 42 by 57 ft., at 836-42 Swanson St., in the lower section of the city. They are manufacturers of cotton and woolen railroad waste and will remove into their new buildings as soon as finished. Their present location at 433 Spruce St. was damaged by fire several weeks ago.

Pennsylvania, Philadelphia. H. Durfor, under the name of the North Philadelphia Towel & Netting Co., has leased the building in the rear of 2910 N. 16th St., where he will manufacture a line of netting and toweling which he will sell direct. Four looms out of an equipment of 12 have been installed and the balance will be put in within a few months. The plant is to be run by gas and Mr. Durfor is buying cotton warps in 2/14s up and 2/3-1/2 up for filling.

Rhode Island, Bellefont. The plant of the Shawmut Finishing Co. has been sold to a new company known as the Imperial Printing, Bleaching & Finishing Co., which has just been incorporated with capital of $100,000. John R. Butterworth, Jr., of Cranston, who is connected with the Providence Sizing Co., is treasurer of the new company and John R. Butterworth, Sr., formerly superintendent of S. H. Greene & Sons Corp. at River Point, is general manager and buyer. The Shawmut Finishing Co. was recently declared bankrupt and Robt. Grieve leased the plant temporarily to the Hohokus Bleachery. The new owners intend to start the plant as soon as possible on printing and finishing cotton fabrics. Some repairs will be necessary.

Texas, Dallas. According to reports the Ajax Waste Mills will rebuild their plant, recently destroyed by fire at a loss of $35,000.

FAILURES AND SUSPENSIONS.

New Jersey, Paterson. A voluntary petition in bankruptcy has been filed by the Reliable Silk Throwing Co. which has a plant in the Strange Mill on Madison St. The assets are scheduled at $20,000 and the liabilities at $12,000. Henry H. Parmerlee of the Hamilton Trust Co. was named as trustee by the Court and Edwin J. Adams of Newark was named as referee. The company was engaged in silk throwing, winding and doubling.

Pennsylvania, Allentown. The failure is reported of the Standard Knitting Co., Hall and Maple Sts., manufacturers of ladies' Swiss ribbed underwear on 6 knitters and 12 sewing machines. The plant has been shut down. The capital stock is $20,000. D. F. Bast is pres.; John Weidner, treas.

Pennsylvania, South Bethlehem. Geo. D. Dobbins, proprietor of the Excelsior Knitting Mill, has been adjudged bankrupt. The liabilities are scheduled at $70,000 and the assets at $115,000.

Virginia, Norfolk. Vincent Fiske Wilcox, of the law firm of Russell, Murray & Co., has been appointed receiver for the Norfolk Silk Co. The main plant at Norfolk is shut down. The branch plant at Midland Park, N. J., has been closed for several months.

Virginia, Norfolk. A voluntary petition in bankruptcy has been filed by the Norfolk Silk Co., broad silk manufacturers with factories at Norfolk, Va., and Midland Park, N. J. The liabilities are scheduled at $470,721, and the assets at $467,720. The Midland Park plant has been closed for several months and a few days ago the main plant at Norfolk was shut down, the reason given being that extensive repairs were to be made.

FACTS AND GOSSIP.

.....

Massachusetts, Holyoke. With the satisfactory settlement of the carpenters' strike, the general strike of the building trades has been called off and work has been resumed on the new mill for the Goetz Silk Mfg. Co., the cellar and floor of which were up when the strike occurred. Wm. Skinner & Sons concelled the contracts for enlargements they had made when the strike was declared and have not as yet reached a decision to take up the matter again. It was their intention to tear down their old building on Dwight St. and replace it with a modern structure. They are still considering the matter and probably will decide to make the improvement this year. Work on the mill of the Farr Alpaca Co. has not been stopped and Mr. Metcalf, the treasurer, states there will be no interruption in the building of the structure until it is finished. The erection of the new office building for the Nonotuck Silk Co. of Florence was tied up with other operations in this vicinity, but work has been resumed on this improvement.

Massachusetts, New Bedford. It has been decided not to close the Oneko Woolen Mills as had been intended. Superintendent Marshall is quoted as saying that the fear for a continued depression in the woolen business throughout the country which was entertained at the time the decision to shut down was made has been dispelled.

Massachusetts, New Bedford. A meeting of stockholders of the Booth Mfg. Co. will be held to vote on a proposition to issue $500,000 worth of bonds to cover the increased cost of the plant caused by building a mill that will hold 80,000 spindles, instead of 50,000 spindles as originally planned, and to provide additional working capital.

Massachusetts, North Andover. The carding and picking departments of the Sutton Mills are being operated at night and the weaving and spinning departments are running until 9 o'clock.

Massachusetts, Salem. The C. G. Smith Artesian Well Co., Boston, will soon start work driving two large wells for the Naumkeag Steam Cotton Co. When the foundations were put in for the new mill two springs were found and an attempt will be made to get water for them from the mill.

Massachusetts, South Hadley Falls. The Hadley Mills have been shut down for a few days for minor repairs. Next week the plant will be running as usual.

Massachusetts, Spencer. The property of the Priscilla Woolen Mill, situated on Valley St., was bid in by Leo Blaney at $4,500 at the mortgage sale. The mortgage on the property was held by Chas. M. Prouty.

Massachusetts, Taunton. The suit of E. D. Page of Faulkner, Page & Co. and others against the Whittenton Mfg. Co. for the purpose of preventing the defendants from putting into effect the vote of the directors to change the capital of the company in a plan of reorganization, has been decided in favor of the mills.

Massachusetts, Warren. The Bradford Yarn Mills, which are dependent on the Quaboag River for water power, are feeling the effects of low water.

Massachusetts, West Warren. Concerning the rumored shutdown of the Warren Cotton Mills of the Thorndike Co., Walter B. Hall, agent, states that the mills probably will shut down the first week in July, but reports of an indefinite shutdown are wholly erroneous.

New Hampshire, Somersworth. At the annual meeting of the Great Falls Mfg. Co. a larger number of stockholders than usual were present owing to the rumors regarding the possible sale of the company's plant to the Amoskeag Mfg. Co., about 80 per cent. of stock being represented. There was no mention made of the rumor that the plant would be sold.

New Jersey, Bridgeton. Geo. W. Preston Co., who moved here from Paterson several months ago and reorganized, now have 30 looms in operation on Turkish towels, face cloths and other Terry cloth specialties. Geo. W. Preston is president and buyer and J. Warren Miller is treasurer.

New Jersey, Camden. The late William Lee, operating 38 braiders on cotton and silk cards at 112 N. 9th St., has been succeeded by his son, Elmer Lee, who is now conducting the business at the old address.

New Jersey, Gloucester. Creditors of the Fries-Harley Co., manufacturers of carpets and rugs, have obtained from the Court an order for the company to show cause why a receiver should not be appointed. They have also asked for an injunction to restrain the present management from operating the plant. A statement issued to creditors of the Fries-Harley Co. shows the assets are $359,235 and liabilities $246,425.

New Jersey, Newark. A charter has been granted Fried & Co. to manufacture textile fabrics with capital stock of $100,000. The incorporators are I. Fried, L. J. Fried and F. Fried of Newark.

New Jersey, Passaic. It is rumored that an increase will be made in the capital of the Botany Worsted Mills.

New Jersey, Paterson. Frank Frost has been appointed receiver for the American Braid Co., located in the Murray Mill. He reports the business will be closed out.

New Jersey, Paterson. Emanuel Gerli will build a new mill with frontage of 55 ft. on North Ave. and 150 ft. on Ward St. Work has been started on tearing down the old Hamil and Booth mill. It is the intention of Mr. Gerli to lease the building in whole or in part.

New Jersey, Paterson. A charter has been granted Frost & Van Riper to manufacture silk and other textile fabrics, with capital stock of $100,000. Harry B. Frost, Paterson, Anthony V. Van Riper, Paterson, James Clark, Paterson, and John C. Clark of Pittston, Pa., are the incorporators. The new corporation succeeds to the business of Frost & Van Riper, with plants here and at Pittston, Pa.

New Jersey, Paterson. A charter has been granted the Cosmos Thread & Yarn Co. with capital stock of $250,000 to manufacture silk and other textile fabrics. It is stated that business will be started at 149 Jasper St., Paterson. The incorporators are Henry Schulz, Demarest, N. J.; Frederick A. Spitzer, 1821 Topping Ave., New York, and S. Friedberg, 150 Nassau St., New York.

New Jersey, Paterson. Creditors of the Kane & Wilkinson Silk Co. have been asked to grant the concern an extension of one year on the indebtedness of $170,000. It is proposed to make payment in twelve equal installments, one each month, beginning in September. Nominally the assets are $50,000 in excess of the liabilities. The Kane & Wilkinson Silk Co. operates 300 looms on broad and tie silks.

New Jersey, Paterson. The Henbert Silk Co. has removed to the top floor of the Dale Mill, lately vacated by Altshuler Bros.

*New Jersey, Paterson. Work has been started by Ralph Rosenheim, owner of the Augusta Silk Works, on a building 300 by 60 ft., 4 stories high, on Madison St., between 9th and 10th Aves. It is hoped to have the building finished by January 1. Mr. Rosenheim is as yet undecided as to whether the Augusta Silk Works will occupy any of the space in the new building which is being built chiefly for the purpose of renting to other concerns.

New Jersey, Paterson. A part of the roof of the Empire Silk Co.'s plant was torn off in the recent storm and there was heavy damage to machinery and stock by water. The loss is heavy.

New Jersey, Paterson. The Favorita Silk Co.'s plant was damaged about $2,000 in the recent storm.

New Jersey, Paterson. Johnson, Cowdin & Co., ribbon manufacturers, sustained loss estimated at $50,000 iu the severe storm of this week. A section of the roof, 250 by 30 ft., was torn off and 4 floors were flooded with water, damaging the machinery and silk in process. The loss is fully insured.

*New Jersey, Perth Amboy. The recent report that the Valentine & Bentley Silk Co. was negotiating with authorities of Perth Amboy for concessions for the proposed new silk company which they propose to operate as an annex is partly erroneous. The Victory Silk Co. of Paterson is the concern interested and Valentine & Bentley Silk Co. acted for them. The latest advices state that the deal may fall through owing to the Perth Amboy authorities not coming up to their original agreement.

New Jersey, Somerville. The yarn dyeing and bleaching business established here about a year ago by Emil A. De Witte under the style of the De Witte Dyeing & Bleaching Works, has been incorporated under the same style with capital of $25,000. The incorporators are Emil A. De Witte, Auguste R. De Witte and Frederic Jackson, the latter of Philadelphia. The plant is located at 199-209 West Main St., where cotton, woolen and worsted yarns are dyed and bleached.

*New York, Amsterdam. Shuttleworth Bros. Co. deny the report that they will build a 6-story addition in the East end of the city.

New York, Haverstraw. The present officers of the Home Silk Mills are K. Wilbur, president; H. Seltmann, vice-president and buyer; H. W. Boettger, secretary, and F. R. Knight, treasurer. The mill is running to full capacity, weaving broad silks on 200 looms. The New York office is at 225 Fourth Ave.

New York, New York City. A charter has been granted the Silk Importing & Winding Co. with capital stock of $5,000. The incorporators are Russel Goldman, Ad Foshay, 21 Park Row, and Frank Disch, 78 Park Ave.

*New York, New York City. As suggested in an earlier report, Bauer & Black, a New York corporation recently chartered, is a branch of Bauer & Black of Chicago. All manufacturing will be done at the Chicago plant.

New York, New York City. The Glenham Embroidery Co. has been incorporated with capital stock of $1,000,000 by David Schoenfeld, Ferdinand S. Schloss and Eugene Loeb, all of 415 Broadway, New York. It is probable that this new corporation is to operate the curtain and embroidery plant at Groveville, N. Y., in the buildings formerly known as the Groveville Carpet Mills purchased several months ago by Loeb, Schoenfeld Co.

New York, New York City. Articles of incorporation of Julius Kayser & Co. have been filed with the Secretary of State. The new corporation will succeed to the business of the same name with main office at 45 E. 17th St. and plants at Brooklyn, Owego, Hornell, Sidney and Amsterdam. The authorized capital is $10,500,000 divided into $3,000,000 first preferred, $750,000 second preferred and $6,750,000 common stock. The incorporation is for the purpose of providing additional funds for the growing business of Julius Kayser & Co.

New York, Syracuse. A charter has been granted the Cotswold Comfortable Co. with capital stock of $25,000 to manufacture comfortables and mattresses. The incorporators are Chas. Van Wagenen, Harry Barbour and Ernest J. White of Syracuse.

New York, Utica. The Oneida-Regal Textile Co. has been incorporated with capital stock of $1,000,000. This is a merger of the Oneida Hosiery Co. with plants at Oneida, Waterville and Philadelphia; the Regal Textile Co. of Syracuse, and the Stittville Knitting Co. of Stittville. W. H. Stansfield, Syracuse, has been elected president; Geo. A. Frisbie, Utica, treasurer. The principal office of the company will be in Camden. The directors are Wm. H. Stansfield, Syracuse; Willard J. Frisbie, Camden; Geo. A. Frisbie, Wm. R. Davenport, Utica; Jesse F. Burton, Philadelphia; Christopher H. Oaks, Troy, and Chas. A. Byington, Utica. The Oneida Hosiery Co. operates 584 latch needle knitting machines on men's seamless half hose, men's and children's ribbed hosiery and men's, women's and children's seam-

less cotton hosiery. The Regal Textile Co. manufactures women's ribbed cotton underwear and union suits on 173 latch needle knitting machines and 150 sewing machines. The Stittville Knitting Co. manufactures men's and children's flat underwear and union suits on 20 spring needle and 7 full fashioned knitting machines. Clift & Goodrich will act as selling agents for the merger.

North Carolina, Bessemer City. A charter has been granted the Harborough Co. with capital stock of $100,000. The incorporators are O. F. Mason of Gastonia, N. C.; J. W. Sanders, Tuscaloosa, Alabama and Palmer Brown, Jr., of Woonsocket. Mr. Sanders is now managing the mill, spending part of his time in Bessemer City.

North Carolina, Brevard. J. W. Chapman, temporary receiver for the Transylvania Cotton Mill Co., has been made permanent receiver. The mill is idle.

North Carolina, Cherryville. The management of the Howell Mfg. Co. has decided to put on a night force of operatives. Cotton yarns are manufactured.

North Carolina, Randleman. The Deep River Mills have been chartered with $600,000 capital stock to acquire the Naomi Falls Mfg. Co. and the Randleman Mfg. Co. mill at Randleman, which were bought by J. E. Gilmer of Winston-Salem, as reported. Mr. Gilmer and H. G. Chatham, also of Winston-Salem, and J. C. Watkins of Greensboro, N. C., are the incorporators of the new company. The Naomi Falls and Randleman Co. were adjudged bankrupt last December and F. H. Fries of Winston-Salem and T. A. Hunter of Greensboro were appointed receivers and instructed to continue the mills in operation. Both properties were sold to Capt. J. E. Gilmer as going plants.

*North Carolina, River Falls. It is expected that J. W. Menefee, who headed the proposed River Falls Cotton Mills Co., will build a mill in the fall. At the present time Mr. Menefee is employed by Faulkner, Page & Co. of New York and Boston. The company was formed a little over a year ago to build a 10,000-spindle and 240-loom mill for manufacturing convertible goods and plans were prepared for a building, but owing to the depression Mr. Menefee decided not to build until prospects for the successful manufacturing of this class of goods were better.

North Carolina, Siler City. The capital stock of the Hadley People's Mfg. Co. has been increased from $36,800 to $51,800 to cover recent improvements.

*North Carolina, Stubbs. Chas. C. Blanton, one of the purchasers of the property of the Buffalo Mfg. Co., at the recent sale, advises that he and his associates will not operate the mill for the present at least.

North Carolina, Vass. The Vass Cotton Mills Co. is reported to be in full operation. Five thousand spindles have been installed on which 30s to 36s yarns are made.

*Ohio, Bellefontaine. A new plant is to be established here by the recently incorporated Bellefontaine Mattress & Comfort Co. and the business and plant of the Goodfellow Comfort Co., South Vienna, will be taken over. John Goodfellow is one of the incorporators of the new concern.

Ohio, Cleveland. The capital stock of the Ohio Yarn Mills Co. has been increased from $10,000 to $40,000. A 5-set plant is operated on woolen and merino yarns. P. V. Kalina is president and buyer and Peter F. Hasek, treasurer.

Ohio, Dresden. The Forest City Woolen Mills Co. have decreased the capital stock from $450,000 to $250,000.

Oklahoma, Oklahoma City. I. M. Putnam has opened negotiations with eastern and southern cotton manufacturers for the organization of a large company to locate a cotton mill in Oklahoma City, and representatives of manufacturers in Massachusetts, Georgia and South Carolina are reported to have looked over the situation here and submitted favorable reports to their principals. Mr. Putnam is coming east in July to confer with men who are interested in the plan. Negotiations were first taken up in March when the Southern Commercial Congress met at Atlanta, Ga. It is planned to build a plant big enough to create its own community, $5,000,000 being the capital tentatively decided upon.

Pennsylvania, Bethlehem. The Bethlehem Dye Works, a new concern which began operations last December, is busy dyeing, bleaching and finishing hosiery. A. B. Harbison is treasurer and buyer.

Pennsylvania, Easton. John Crossley & Sons, Ltd., English carpet and rug manufacturers, have decided to locate a branch plant here and have purchased 20 acres on the south side of Industrial Tract. It is said the proposed plant will be a duplicate of their English mills.

Pennsylvania, Freeland. The Washington Silk Co. has been incorporated with capital stock of $35,000 to manufacture silk, do throwing and weaving. The incorporators are W. E. Martin, John Shigo, Condy O'Boyle, Robt. A. Lentz, B. F. Davis and others.

Pennsylvania, Hyde Park. The Reading Towel Mfg. Co. of Reading, which recently took possession of a 3-story brick factory building at Hyde Park, has installed several looms and employs 25 hands making Turkish towels of several grades.

Pennsylvania, Milton. The property of the Sydney H. Souter Silk Co. has been purchased by the Susquehanna Silk Mills, which operate plants at Sunbury, Jersey Shore and Lewistown, Pa., and Marion, O. According to reports, the plant will be put in operation at once. The Sydney H. Souter Silk Co. has been in financial difficulties for several months and lately the plant has been idle and in the hands of receivers. There are 12,000 spindles and 150 wide looms which have been operated on thrown silks, dress and tie silks.

Pennsylvania, Philadelphia. F. A. Bochmann & Co., Inc., recently reported by us as incorporating,

have received their charter. The company has a capital of $500,000. They are located at 2d and Somerset Sts., where they are manufacturing dress goods.

Pennsylvania, Philadelphia. C. Christos, formerly engaged in the dyeing of garments at 2821 Helen St., has discontinued that line and is now making a specialty of dyeing silk hosiery only with a capacity of 500 lbs. per day.

Pennsylvania, Philadelphia. It is reported that McIlwain & Co., whose plant known as the Diamond Mills at 1645 North Marshall St. recently destroyed by fire, will not start up again and are offering for sale the equipment of their finishing plant, which is located in another section of the city. They manufacture shoe linings.

Pennsylvania, Philadelphia. Murphy & Bro., manufacturers of woolen and worsted fabrics at 16th and Fitzwater Sts., with branch mills at 60th and South Sts., and Chester, Pa., have taken title to the buildings formerly occupied by the Southwark Mills Co., at 31st and Reed Sts. The plant was recently sold to Murphy & Bro. at public sale for the sum of $55,000. Its assessed valuation is $50,000. The new owners report that it is impossible to state at this time whether they will consolidate and remove their three plants to this location or not.

Pennsylvania, Philadelphia. D. J. McKinley, who succeeded the late Philadelphia Thread Mfg. Co. at Adams and Emerald Sts., where he manufactured sewing cottons and cone winding for the trade, has removed his machinery to Lansdale, Pa., where it has been consolidated with the plant of John Barrows, manufacturer of fishing lines, cotton and linen harness twines, etc.

Pennsylvania, Philadelphia. The Peerless Mills, which applied for a charter during the month of July, 1910, with Albert C. Brand, Esq., as president and Howard L. Godfrey, formerly with George S. Cox & Bro., have opened offices at 834 E. Allegheny Ave. The company, which intended to manufacture hair cloth, has deferred equipping a plant and is doing a business of selling this class of goods on a commission basis.

Pennsylvania, Philadelphia. Thomas Beardwood & Bro., among the oldest finishers of cotton and woolen fabrics in this vicinity, will offer at public sale on June 20 their real estate, consisting of a four-story brick mill, and its equipment.

Pennsylvania, Philadelphia. The American Cloth Manufacturing Co., with a capital of $100,000, D. M. Barr, president, and Jas. McBlane, secretary, treasurer and superintendent, has succeeded the Barr Manfg. Co., American and Somerset Sts., of which D. M. Barr was the proprietor. The plant contains 40 broad looms, which they are operating on cotton, woolen and worsted goods for men's wear, dress goods and carriage cloths, the production being sold direct.

Pennsylvania, Philadelphia. The Balmoral Textile Manufacturing Company, with a capital of $50,000, H. E., H. J. and E. M. Stover as incorporators, have applied for a charter. The company is now manufacturing a line of Scotch rugs and carpets on several looms at Kensington Ave. and Venango Sts.

Pennsylvania, Philadelphia. The Sylvan Worsted Company, with a capital of $25,000, who have just received a charter, is located in the Fretz Bldg., 10th and Diamond Sts., where six looms are operated on woolen and worsted novelties.

Pennsylvania, Philadelphia. An application will be made for a charter for the Bennett & Aspden Co., with Chas. B. Bennett, Newton J. Aspden and Walter E. Rosenthal, as incorporators. They are now operating, under the same name, at Leverington Ave. and Baker Sts., Manayunk, a plant for the manufacture of plushes and upholstery fabrics, which they sell through New York.

*Pennsylvania, Reading. A charter has been granted Joseph Bancroft & Sons Co. of Pennsylvania, with capital stock of $250,000. As noted in the report of their intention to incorporate, the corporation takes over the Reading plant of this concern and is merely to facilitate doing business under Pennsylvania laws.

Pennsylvania, Topton. It is reported that the Hartley Silk Mfg. Co., incorporated in New York a short time ago with capital stock of $250,000, will take over the Hartley Silk Mfg. Co. of this place, with offices in New York.

Pennsylvania, York. Negotiations are pending for the Diamond, Monarch and York Silk Mills to pass into new hands and for their joint operation and according to late advices the transaction may be completed within a week. At present the three plants are owned by the bondholders. It is intimated that an outright sale is pending to a company of men who intend to invest largely in the silk manufacturing business here and locally it is believed that there is every reason for the deal to go through. The Diamond Mill was started up May 1 for the bondholders under the name of the Diamond Silk Mill on commission silk throwing. Previous to that time both the Diamond and York Mills were run on leases, the terms of which expired April 15. The York Mills are at present shut down.

Rhode Island, Bridgeton. Herbert M. Wilson, who operated a plant here on yarns and shoddy, has discontinued business.

*Rhode Island, Pawtucket. The Union Webbing Co., reported incorporated in April with capital stock of $20,000, takes over an established plant at 48 Hughes Ave., manufacturing cotton, mercerized and silk webs in widths from 1 to 2 1/2 inches. In the fall the plant is to be moved to Lowell, Mass. Chas. N. Dyer, a narrow fabric manufacturer located at 287 Thorndyke St., Lowell, is president, and Andrew Y. Rodger, president of the Pentucket Narrow Fabric Mill of Lowell, is superintendent. Johnson & Walker, 27 Exchange St., are the selling agents and for the present this is the office address of the mill.

New Publications

[Any work noticed under this head can be obtained through the office of this journal.]

Lamb's Textile Industry of the United States; 451 pages, 8 by 11; J. H. Lamb Co., Boston, Mass., publishers; complete in 5 vols.

This work, the first volume of which has just been issued from the press, will doubtless prove of value to all those who are in any way interested in that article of manufacture which has during the past century been so stupendous and compelling a force in the building up of the industries of the whole nation. Of the information contained in this initial volume in regard to the growth of the cotton industry, and how and by whom it has been accomplished, much is recorded that has never been set down before in a work of a similar character and the series of articles are written or revised by men who are recognized authorities on the subjects of which they treat. Daniel C. Roper, government statistician, furnishes the article on the "Production of Cotton in the United States"; the article on Ginning is revised by A. L. Smith of the Continental Gin Company; "Transportation in its Relation to the Cotton Industry" is from the pen of W. W. Finley, president of the Southern Railway; "Cotton Speculation in America" is written by Carl Geller, cotton broker; "History of Spinning," by the late General William F. Draper; "History of Weaving," revised by George Crompton; "Mercerization of Cotton," by John H. Lorimer; L. Da Costa Ward, professor Chem. Phila. Textile school, furnishes the article on "Bleaching, Dyeing and Printing"; "History of the Dyestuffs and Dyeing Industries" is by Herman A. Metz; and the "History of the Development of the Coal Tar Dye Industry in U. S. A." is written by J. F. Schoelkopf. These are followed by articles on "Flax, Hemp and Jute," and their manufacture. "The Evolution of Water Power," by Charles T. Main, expert engineer; "Electric Power as Applied to Textile Machinery," is by Sidney B. Paine, electrical engineer; "Mill Engineering," by F. W. Dean, and "The History of Factory Insurance," by Frederick Downs.

The second part of the book is devoted to biographies of some of the men who have built up the cotton and kindred industries of the United States—among these subjects we find such men as Augustus Lowell, Richard Borden, Abraham Marland, Robert Rogerson, William W. Wellington, David A. Brayton, George F. Fabyan, Arthur T. Lyman and William Whitman, and others of like standing, too numerous to mention here. Then come a few histories of mills, which complete the letterpress.

The book is handsomely and profusely illustrated. A steel portrait of Samuel Slater is the frontispiece, and there are forty other steel portraits among them, General W. F. Draper, Arthur H. Lowe, Frederick C. Sayles, Patrick Tracy Jackson, etc.

There are in addition, 12 plates, each of which illustrates a special article, and shows four or five phases of the industry of which it treats; thus: Plate I shows the cotton boll unripe and opened, plants of the different varieties, fields showing the different operations of cultivation, and a map of the cotton area furnished by Mr. Roper. The other plates illustrate in the same way Ginning, Transportation, Carding, and Combing, Spinning, Winding, Weaving, Printing, etc. There is besides a complete and comprehensive index which further enhances its value as a work of reference.

Altogether it is a commendable undertaking, ably executed, the printer has done his part and the printing of both letterpress and illustrations is excellent. The volume is handsomely bound in morocco. Sold by subscription only. J. H. Lamb Company, Publishers, Boston.

A Manual of Cloth Finishing; by the Editors of the Dyer & Calico Printer; 300 pages, 6 1/2 by 9 1/2; Heywood & Co., 150 Holborn, London, Eng.

This is a well written and elaborately illustrated work on cloth finishing which manufacturers and finishers of woolen, worsted and union fabrics will find of great value. The following abstract from the table of contents gives the scope of the work: Part 1. Construction and Arrangement of Works, Drugs Used in Woolen Finishing, Wool Fibers and their Properties. Part 2. Singeing, Crabbing and Decatizing, Roll Boiling, Fulling or Milling, Scouring, Raising, Filling and Weighting, Tentering, Drying Otherwise than by Tentering, Lustering, Cropping or Cutting, The Mechanics of Cutting Machines, Grinding and Setting Cutting Machines, Perching, Drawing, Dewing or Damping, Shrinking, Embossing and Friezing, Pressing, Machine Presses, Roller Presses, Steaming, Rigging, Cuttling and Cramping, Faults and Defects in Finishing. Part 3. London Shrinking, Waterproofing, Machinery for Waterproofing, Worsteds and Imitation Worsteds, Serges, Cut Figures, Faced Cloths, Prints, Witneys, Vicunas and Tweeds, Trouserings, Carriage Cloths. Part 4. Specialties in Cloth Finishing Machinery.

BUSINESS LITERATURE

Water Filters; Hungerford & Terry, Inc., Philadelphia, Pa.

A 32-page booklet describing and illustrating the various water filters manufactured by Hungerford & Terry. It also devotes considerable space to the preliminary treatment that highly polluted waters must receive prior to filtration.

DAYLIGHT ILLUMINATION

We have received a copy of the June 14th issue of the American Architect which contains a very interesting article on "Daylight Illumination for Manufacturing Buildings." It is illustrated with a number of excellent half tone engravings showing results obtained in illuminating mills equipped with steel windows, which are rapidly gaining in favor in this country and which have been in extensive use in England for a considerable time.

Industrial Notes

RUMOR WITHOUT FOUNDATION

Louis Hirsch, the American agent of H. Alban Ludwig, of Chemnitz, Saxony, manufacturers of full fashioned hosiery machines, denies most emphatically that there is any foundation for a rumor in knit goods manufacturing circles that the Ludwig business had been bought up by other Chemnitz manufacturers. Ludwig's has been in existence for thirty-two years and have earned a high reputation for their machinery. Mr. Hirsch wishes to assure the trade that the business will be continued in the same way as before and to place no confidence in these rumors.

CARD STRICKLES

Horatio L. Miller, manufacturer of the Miller improved card strickle, has moved his factory to more commodious quarters, and is now located at 54 Hermon St., Worcester, Mass. Mr. Miller has had twenty years' experience in card clothing manufacture and is familiar with the many difficult problems with which carders and users of card clothing are concerned and all strickles manufactured by him give general satisfaction. They are made in two grades, to suit coarse and fine wire. He invites correspondence with all possible customers.

STEEL HEDDLES

A good point is made by the Steel Heddle Mfg. Co., 2110 Allegheny Ave., Philadelphia, that in buying their flat steel heddles, a comparatively permanent addition is made to the loom because of the long wear without the necessity of replacement, so that the supply bills are correspondingly lessened. These heddles are punched out of a single piece of tested steel, so flexible that it will adjust itself automatically to yarn of any count from fine silk to the heaviest yarn for men's wear. It has a round, cornerless eye of solid steel and no solder to wear or corners or grooves to catch and pull the yarn. A number of mills are still using the same steel harness bought ten years ago.

Messrs. Fearing, Whiton & Co., 655 Atlantic Ave., Boston, manufacturers' selling agents, announce that the connection of J. D. Whittaker with that company terminated on June 7.

The Philadelphia business of Charles W. Becker, Agt., dealer in cotton and woolen waste, Amsterdam, N. Y., has been transferred to The Becker-Denison Co., 100 Chestnut St., Philadelphia.

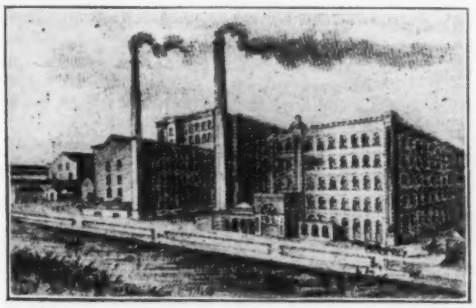
Messrs. E. T. Murphy and A. T. Lewis have formed a partnership to act as sales engineers for the Buffalo Forge Co., Buffalo Steam Pump Co., and the Carrier Air Conditioning Co., in the territory formerly handled by E. T. Murphy, with offices at 1303 Land Title Bldg., Philadelphia.

THE SOUTHERN NEW ENGLAND TEXTILE CLUB

This organization held its monthly outing on June 17th, a large number being in attendance. After the dinner a business meeting was held at which the following officers were elected for the ensuing year: President, A. W. Dimick, Fisherville, Mass.; vice-president, C. D. Robinson, Crompton, R. I.; secretary and treasurer, G. C. Hinckley, Valley Falls, R. I. Executive committee: Henry C. Dexter, Pawtucket, R. I.; Robert Stewart, Lonsdale, R. I.; F. L. Chase, Providence, R. I.; F. W. Howe, Providence, R. I.; E. R. Richardson, Pawtucket, R. I.; Alex. Makepeace, Fall River, Mass.; Charles M. Holmes, New Bedford, Mass.; George P. Grant, Jr., Fitchburg, Mass. An exciting game of base ball between two nines, one headed by James Cooper of Whitinsville, and the other by Philip Wentworth of Drapersville, resulted in a victory for the Cooper team by a score of 7 to 5.

THE MARSLAND MILLS

About the year 1830 Robert Marsland entered the business of Taylor & Chatwell, cotton spinners and doublers, Ancoats Bridge Mills, Manchester. Six years later he became sole owner and changed the name of the firm to Robert Marsland & Company. During the next 50 years he carried on the



A VIEW OF THE MARSLAND MILLS

business in partnership with Mr. Edward Darnton and made specialties of lace thread, hosiery yarns and cotton warps and the firm had a good reputation throughout Europe.

The business was continued by Mr. Marsland's sons after the retirement of the former partners in 1884 and 1887 respectively, until the formation of the Fine Cotton Spinners' and Doublers' Association in 1898, when Mr. Herbert J. Marsland joined the board of the Association and continued to sit as director up to the time of his death. The general management of the mills continued and remains in the same hands as in the days of the private firm. In later years they have opened up agencies in all markets where they have found a demand for their productions and have found that direct dealing with the actual users of the yarn have proved most advantageous to their trade.

They have not only benefited from the absence of middle men's profit, but the direct relationship

has been found an inestimable benefit by enabling them to understand and fill the exact requirements of their customers and to some extent to cooperate with them in bringing new ideas to a successful issue.

They have the advantage of the services of T. J. Porter & Sons as sole agents in the U. S. A., and have since last fall put down a plant equipped with the best machines for turning out a considerable production of mercerized cones for the hosiery trade. Their productions in hosiery yarns extends from 2/40s up to the finest counts, in both carded and combed Egyptian and Sea Island cottons.

In bringing the yarns to the notice of the hosiery manufacturers they can point to a high reputation in England and Germany for having a clean thread which has always remained uniform in quality. The whole process of the manufacturing from raw cotton to finished mercerized cones is carried out under the personal supervision of the firm, which prevents their reputation from suffering by being in other people's keeping. As in hosiery so in fancy goods. The great development of the trade in high grnde cotton since the improvements in artificial silk, has necessitated a large increase of their plant for dealing with the demand for cotton warps and pirns.

In meeting the demand for velvets they have also found very profitable employment, while the Swiss embroidery industry has contributed for years to keeping certain portions of their plant steadily employed. In Nottingham, Bradford and the various continental manufacturing towns, there are many manufacturers who have used the Marsland yarns exclusively during three generations and it will be the endeavor of the firm to establish as high a reputation in America as that which they enjoy elsewhere.

BIG ADDITION TO GOULDS MFG. CO.'S PLANT

The Goulds Manufacturing Company of Seneca Falls, N. Y., are about to build four large additions to the No. 2 Plant, in which will be housed the part of the works known as the No. 1 Plant, part of which will be torn down to make way for the new barge canal. The new buildings will be parallel with the foundry buildings. A one-story storage building for rough castings is completed. This building is 240 feet by 60 feet and of mill construction.

Two machine shops, 300 by 100 feet, will parallel the storage building. They will be of steel frame and brick construction and about 70 per cent. of the wall surfaces will be glass. South of the two machine shops a four-story warehouse 240 by 60 feet will be built. These will be reinforced concrete and on the south side there will be a loading platform. The New York Central will build two additional switches along the warehouse. All the new buildings will be lighted with tungsten clusters and will be heated and ventilated by the hot blast system. All the equipment of the machine shops will be motor driven. By Nov. 1 the buildings will be ready for use.

New Jersey, Rahway. Loss of $30,000 was caused by fire in the plant of the Royal Mfg. Co., manufacturers of cotton and wool waste. The capital stock of the company is $200,000.

AN OLD-FASHIONED HAND LOOM

The accompanying illustration is an interesting reminder of the survival of hand loom weaving in different parts of the country. It shows Mrs. Mary Wilson, Newfane, Vt., operating a hand

MRS. WILSON AT HER LOOM

loom on carpeting. Mrs. Wilson, who is 75 years old, has for many years been engaged in this occupation. Although Mrs. Wilson has lived nearly three-quarters of a century she is still strong and active and is likely to be able to spin and weave for many years. Like many people of her age, and in similar circumstances, she is inclined to regard modern improvements with a shade of contempt. She does not believe that any one now living possesses sufficient skill to make a reed like that in the old-fashioned loom. It was certainly a fine piece of mechanical work. None have been manufactured for many years, steel having taken the place of reeds or wood for that purpose.

BOSTON OFFICE

Rothschild & Nuzum, dealers in cotton, and members of the New York and New Orleans Cotton Exchanges, have opened a Boston office at 70 Kilby St. A. P. Kirk will be in charge as their representative.

HOLYOKE PRODUCTS

Under the auspices of the Holyoke Board of Trade, a unique exhibition of Holyoke products was held from June 21st to 24, consisting of a display of exhibits in the show windows on High and Dwight Streets by the manufacturers of Holyoke. Forty-four different manufacturing concerns participated, including the following in the textile line: American Thread Co., Beebe-Webber Co., Bullard Thread Co., Farr Alpaca Co., Germania Mills, Lyman Mills, Wm. Skinner & Sons and the Springfield Blanket Co., and besides these a number of concerns building machinery for the textile mills, Coburn Trolley Track Mfg. Co., Dean Steam Pump Co., Holyoke Belting Co., J. & W. Jolly and B. F. Perkins & Son.

TOOL STEEL

Field & Co., Inc., of Philadelphia, have for a long time made a specialty of steel adapted for tools and fine machinery. They count among their customers builders of knitting machinery and fine textile specialties, and their experience in this line is helpful to those who are desirous of selecting the proper kind of steel for certain purposes. There is a great difference in the quality and characteristics of steel, and the wear and satisfaction that a machine will give to the user is very largely dependent upon the stock that goes into it, apart from the skill and merit of the design of the machine itself. This company manufactures and carries in stock many styles and sizes of standard steel, not only for tool and machine making, but including shafting, seamless tubing, twist drills, cutters, etc.

"CORONATION" BOOKLET

A handsomely gotten up pamphlet has been prepared and issued by Birch Bros. Somerville Machine Works, Somerville, Mass., containing a number of pictures which are of particular interest at this time, when the coronation ceremonies have been so much in the public eye. They will be glad to send a copy of this booklet to any person who is interested in the use of piece-end sewing machines, especially superintendents and those in charge of dye houses, bleacheries and finishing works, if they mention the Textile World Record.

MILL STATISTICS

Hawkes, Tewksbury & Co., specialists in mill stocks, with offices in Boston, New Bedford and Springfield, have compiled their fifth semi-annual statistical sheet on Fall River and New Bedford mill stocks, revised and corrected to date. It gives the dividend record of each mill, particulars about its capitalization, number of spindles, number of looms, capitalization per spindle and the class of goods made. This is not only of interest to investors in mill stocks, but to the trade at large, as it gives a very good idea of the financial strength of the different corporations and may be had on application to their Boston office, 19 Congress St.

TIN AND COPPER CYLINDERS

Charles E. Sandberg, 65 Thomas St., Worcester, Mass., has added tin and copper cylinder manufacturing to his line and is constantly increasing his business with textile manufacturers. This includes roving cans, drying cans, blow pipes and cylinders of all diameters. Mr. Sandberg pays particular attention to the repairing of slasher cylinders. He also makes sheet metal workers for all makes of cards.

SIZING AND FINISHING

The Arabol Mfg. Co., 100 William St., New York, desire to call attention to their ability to advise manufacturers regarding difficulties that may arise in connection with the sizing and finishing of goods. Scientific specialization, long and extended experience, modern facilities in factory and laboratory enable them to meet any conditions. They are continually adding to the staples that have made them familiar with the textile trade.

WIRE HEDDLES

Howard Bros. Mfg. Co., Worcester, Mass., the well known makers of card clothing, are now prepared to furnish wire heddles, of either domestic or German make, for all kinds of weaving or for any make of looms. They solicit correspondence with manufacturers and would be pleased to quote prices and furnish samples on request.

FRANK BAILEY

The custom dye works in and around Philadelphia, and indeed very generally throughout the country, are quite busy. Frank Bailey of Cedarbrook, N. J., supplies a large part of the trade with dyesticks, and finds this branch of his business holding its own. Mr. Bailey has quite recently designed a new fireproof hot air yarn drying machine, which embodies some novel features. He has installed several of these machines, and has orders for more, which he is engaged in filling. The Woodland Worsted Mills, of which he is president and treasurer, are quite busy. Mr. Bailey sells his own goods and keeps in close touch with all branches of the trade, and being a practical man himself, is able to give suggestions of real value. He has quite recovered from his recent severe illness and is once more about the mills.

Pennsylvania, Scranton. The Scranton Textile Co., for which Wm. H. Logan was appointed receiver in July, 1910, has been declared solvent and the Court has ordered the receiver to turn over the property to the officers of the company. The stockholders have made a proposition to pay cash to the creditors with claims of $100 or less, and to pay 25 per cent. cash and 75 per cent. stock of the company to those having claims for over $100. Bonds are to be issued to the holders of two mortgages. This arrangement meets with the approval of the creditors.

RECENT TESTS OF MACHINERY BRAKE LININGS

Professor C. L. Norton of the Massachusetts Institute of Technology has recently made some exhaustive tests of materials used as machinery brake linings. The results of these experiments show that asbestos is a superior material for this important part of certain classes of machinery.

Two specimens of the asbestos lining, called respectively J. M. Non-Burn "A" and "C," showed a co-efficient of friction of .37. The relative value of asbestos linings to other linings may be found by comparing this figure with the figures given as follows:

CO-EFFICIENT IN MOTION

Material	Dry	Wet	Oily
Asbestos to Metal	.37		.20 to .25
Metals on Metal	.15 to .24	.31	.20 to .06
Wood on Metal	.20 to .62	.24	.20 to .06

Oil was applied to these asbestos brake linings without any great effect. While it was possible by means of a forced test of oil between the asbestos lining and the metal drum to bring the co-efficient of friction down as low as .20, it was found that a good value for the co-efficient of friction of the asbestos brake linings after they had been soaked in oil or exposed to splashing from oil is from .20 to .25. Values as high as .30 are not infrequent for an oily lining used under high pressure. Even when the asbestos brake lining was thoroughly saturated with oil the co-efficient of friction, although it went down materially upon the first application of the brake was not greatly affected. It is to be noted that under the heat of the friction when the brake was again applied to the drum, the oil was quickly volatilized and the co-efficient of friction was rapidly raised toward the maximum when dry.

Professor Norton also brings to mind, that in comparison with the working efficiency of other materials, while certain materials when dry show a co-efficient of friction comparable with that of asbestos on metal, it will be noted that these go down very materially when wet or oily. For instance, wood and metal may run as high as .62 when dry, but become practically valueless at the minimum when oily.

The Asbestos brake lining referred to is manufactured by the H. W. Johns-Manville Co., New York.

SYNTHETIC INDIGO

The Society of Chemical Industry, of Basle, Switzerland, by putting on the market July 1st their synthetic indigo, have rounded out their product of vat colors. This is in both paste and powder form and makes a very complete line of fast vat dyes manufactured by this Society.

This new color differs from anything that has been on the market, so they state, both because of the methods employed in its manufacture and a new electrolytic process used in making the intermediate products, the result of many years of experiment.

The Society has bought a power plant at the foot of the Alps, making them independent as to coal supply and enabling them to manufacture to the best possible advantage. A. Klipstein & Co. are sole agents for the Society in the United States and Canada.

FROM FIBER TO FABRIC

J. Edmund Estes, of the Estes Mills, Fall River, Mass., is not only a manufacturer of absorbent, bleached and gun cotton, and cotton twine and cords, but he is also a poet, as all will agree who read the following lines inspired by the recent centennial of the Fall River Cotton trade:

Ye who would enter and explore
Come with me to the factory door;
Allied as links in mighty chains
Here find machines and brawn and brains,
A labyrinth of cogs and wheels
And noise,—a stranger timid feels.
The snowy down from Southern land
Is seen in mixings made by hand.
Bale breakers some mills have installed
In which pressed chunks are overhauled.
The automatic feeder takes
And separates these ermine flakes;
Straightway they fall on apron slat
And form a lofty moving mat.
Steel beaters turning with great speed
Remove the dirt and broken seed;
Itself this mat doth then enwrap
And forms a firm, cylindric lap.
Into the card this lap is fed
And o'er revolving needles led;
It issues forth in web as frail
And handsome as a bridal veil.
With staple clean, straight and condense
In coiler can 'tis taken hence;
To form a sliver is the aim
Of the condensing drawing frame.
The slubber and fly-frame prepare
A roving even, firm and fair.
Then to the spinning-frame it goes
And stands aloft in graceful rows.
The spindle and the spinning-ring,
The fleety traveler's unseen fling
Produce the yarn, the basis grand
Of every textile in the land.
One-half this yarn is spooled and beamed,
The other half is simply steamed;
The former, before drawing-in,
Rides on hot cylinders of tin
In slashers where 'tis sized and dried;
At last unto the loom applied
It forms the warp, steamed yarn the weft,
The latter in the shuttle deft
Plies to and fro with lightning tread
And each time weaves a tiny thread.
Thus cloth is made, and from the loom
'Tis wheeled into the folding room,
Inspected, folded, later shipped
For world-wide service well equipped.

Prosaic weaving are these facts
That represent the constant acts
Of old King Cotton in the mill,
Where he must bow to power and skill.

Toil on, thou worker in the mill,
No proxy can thy duty fill;
Thy task is grand, thy sphere unique,
Praise, praise to thee we here bespeak.

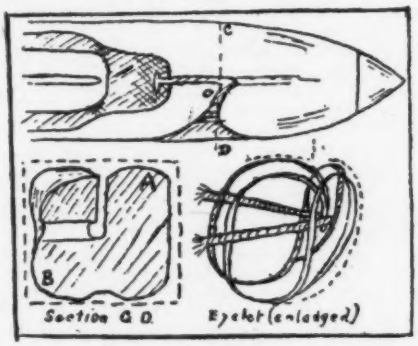
Hum on, good spindle in the mill,
And thus thy manly mission fill;
Pause often in thy work to doff,
And cast a well-filled bobbin off.

Weave on, thou wonder-working loom,
The world is now thy market-room;
The naked clothe on land and sea
And weave the sails of Destiny.

SHUTTLE THREADING

From the Cotton Factory Times

A fortnight ago we described and illustrated a device for threading shuttles by mechanical suction, which had been invented by Mr. Joseph H. Walsh of Seed Hill, Littleborough. The principal features of the invention, it may be remembered, were a wooden cradle and a miniature pair of bellows, the cradle being intended to take the place of the present shuttle stand. With a spirit of dogged determination—the more remarkable considering that he has had no experience of weaving, he being a draper—Mr. Walsh has since approached the problem from the opposite side, turning his attention to the shuttle itself, and has produced a self-threader which is at once ingenious and simple, and effective withal.



In this shuttle there are the usual slits communicating with the weft passage and shuttle eye, and the tension pin, round which the weft passes, serves to strengthen this part of the shuttle. The possibility of increased chipping or of slits catching warp is avoided by cutting slits in such a manner as to have rounded shoulders on each side, and should the shuttle strike anywhere near slits when entering box the blow will be received by broadest or highest parts, viz: base B and shoulder A. (See sketch cross section C.D.) The principal feature of this invention is the additional wire eyelet, which is of peculiar construction, being easy to thread, yet impossible to unthread. As the weft is drawn down into the slits it passes over a projection in eyelet. Return the same way is out of the question, the weft being as secure as if passed through a ring. This eyelet, though so effective, is no larger than an ordinary pot one, and will probably cost less After it has been inserted the ordinary metal eye (split to receive weft) is replaced to take friction. The method of threading needs no description. The cost of shuttle, which the inventor has protected, will be little if any more than that of the present type.

From the Murphy-Simpson Shuttle Threader Co., we have received an illustrated leaflet explanatory of that device. The apparatus consists of a cast iron or steel cylinder, which is bolted to the shuttle stand. Within the cylinder slides a steel piston, with hollow steel piston rod projecting through the front of the cylinder. The piston rod is provided with a rubber pad shaped to fit the shuttle, and to thread the shuttle it is only necessary to place it against the rubber pad, and push, when the partial vacuum formed in front of the piston sucks the weft through the eye. We are informed that extended trials in a number of sheds have proved the apparatus to be satisfactory in every way.

The same firm, it is interesting to know, have a patent for a shuttle which cannot be threaded by the mouth. Writing with reference to an editorial in a recent issue of the "Factory Times," in which it was stated that the ideal shuttle was one which would not permit the weaver to suck the weft through the eye of the shuttle by the mouth, Mr. Howard S. Murphy says: "Do you not think that when compulsion comes, as we are convinced it will in the near future, any arrangement made will be mutual as between employer and employed? If the former supplies a suitable article, we think it will become obligatory on the part of the various weavers' organizations to see that their members use the appliance. At the onset we foresaw this difficulty, and prepared accordingly. Some time ago we took out a patent for a shuttle which cannot be threaded by the mouth, but which the Murphy-Simpson will thread. The alteration to the present shuttle does not interfere with its working parts, and practically costs nothing."

PARTI-COLORED EFFECTS ON TEXTILES

It is well known that treatment with thiosulphates increases the affinity of wool for basic dyes considerably, but it has not hitherto been observed that this treatment lessens the affinity of wool for several groups of dyes, especially acid dyes, azo dyes, chrome developed dyes, adjective dyes, and also sulphur dyes, and direct cotton colors. With this knowledge, the treatment supplies an industrial means of great importance for getting parti-colored effects in yarn and fabric dyeing.

It is of the utmost importance that the thiosulphate-treated goods can undergo all the various processes usual with wool and half wool, such as carbonization, milling, crabbing, decatizing, and so forth, without losing the special affinities imparted to them by the thiosulphates. If, however, the treatment is properly carried out, these various requirements are fulfilled to the letter.

An example of the thiosulphate treatment is as follows: 100 lbs. of goods are worked for from one hour to one hour and a half at 120° F. in a bath containing 24 lbs. of sodium thiosulphate and 16 lbs. hydrochloric acid of 22° B.

Recent Textile Patents

BLEACHING and Softening Jute Fiber. 944,508. Samuel A. Flower, New York.

CARBONIZING and Washing-out Machine for Fibrous Materials. Henry A. Fretts, Hyde Park, Mass.

CLOTH TREATING Apparatus. 994,245. James A. Butler, Winthrop, Mass.

DYEING APPARATUS. Fabric. 993,435. Leon Derreumaux-Bulteau, Brussels, Belgium.

DYEING HALF Woolen Goods. 995,431. Max Becke and Albert Beil, Hoechst-on-the-Main, Germany.

DYEING MACHINE. 994,016. Harvey P. Mallison, Lansdowne, Pa.

EMBROIDERING MACHINE. Jacquard. 995,395. Robert Zahn, Plauen, Germany.

EMBROIDERING MACHINE. Jacquard. 995,394. Robert Zahn, Plauen, Germany.

FABRICS. Manufacture of Cord. 993,465. Thomas Sloper, Devizes, Eng.

FARBIC OPENING Device. 995,522. Franklin Chatfield, Minneapolis, Minn.

FABRICS. Waterproofing. 994,931. Pierre O. Keilholtz, Baltimore, Md.

FIBER CLEANING Apparatus. 993,492. William Youlten, Westminster, Eng.

KNITTING MACHINE. 993,807. Harry H. West, Plymouth, Pa.

KNITTING MACHINE. Hosiery. 995,304. Harry Swinglehurst, Philadelphia, Pa.

KNITTING MACHINE. Glove Finger. 996,015. George H. Gilbert and George W. Lindley, Philadelphia, Pa.

KNITTING MACHINES. Pattern Mechanism for Glove. 996,036. George H. Gilbert and George W. Lindley, Philadelphia, Pa.

KNITTED WEB and Making the Same. 993,799. Robert W. Scott, Leeds Point, N. J.

LOOM SHUTTLE Motion. 994,295. Morris J. Yost, Hanover, Pa.

LOOM for Weaving. Weft-Replenishing. 993,349. John W. Cook, Manchester, Eng.

LOOM for Cross or Gauze Weaving. 994,018. Harry M. Marsh, Hamilton, Ont.

LOOM. 995,954. Henry Cote, West Warren, Mass.

LOOM. Narrow Ware. 993,685. Elbridge E. Holmes, Worcester, Mass.

LOOM Let-off Mechanism. 993,718. Eppa H. Ryon, Worcester, Mass.

LOOM TEMPLE. 995,333. Nazaire Demers, Manchester, N. H.

LOOMS. Center Fork Stop-motion for. 994,820. Henry Cote, West Warren, Mass.

LOOMS. Filling Feeder for Automatic Filling-replenishing. 995,290. Alonzo E. Rhoades, Hopedale, Mass.

LOOM SHUTTLE. 994,578. John F. Dustin, Fulton, N. Y.

LOOMS. Fork-grid Clearer for. 993,443. Sayers D. Eubanks, West Durham, N. C.

LOOM PICKER. 994,807. William Wattie, Worcester, Mass.

MERCERIZING COTTON. 994,076. Paul Hahn, Niederlahnstein, Germany.

PILE FABRIC. Woven. 995,693. Walter V. Lowe, Diggle, England.

SHUTTLE. 994,066. John F. Dustin, Fulton, N. Y.

SILK CLEANING and Twisting Machine. 995,382. George E. Sly, San Diego, Cal.

SPINNING or Twisting and Winding Machine. 994,576. Robert Dawes, Philadelphia, Pa.

SPINNING MACHINE. 993,467. Alfred and John Stell, Steeton, England.

SPINNING or Twisting Machine Thread Guide. 995,564. John E. Prest, Melrose, Mass.

SPINNING MACHINE Thread-breaking Device. 995,672. Ferdinand Q. Hartmann, Danville, Pa.

TREATING CLOTH. Apparatus for. 994,075. David Gessner, Worcester, Mass.

THREAD-PROTECTOR. 994,880. Peter J. Shrum, Monaca, Pa.

WINDING MACHINE. 995,768. William E. Clookie, Lakeview, N. J.

RECENT TEXTILE TRADE MARKS REGISTERED

"Ponjah." Cotton piece goods. Merrimack Mfg. Co., Lowell, Mass.

"Collegiate." Blankets. Capital City Woolen Mills, Des Moines, Ia.

"Comfort." Waterproof fabric. Harry H. Shepard, Providence, R. I.

"Z. & S." Embroideries. Zahner & Schiess & Co., New York.

"Chester Lad." Hosiery. Carson, Pirie, Scott & Co., Chicago, Ill.

"Educator." Hosiery. Carson, Pirie, Scott & Co., Chicago, Ill.

"Aza." Women's garments. William Hollins & Co., Ltd., London, England.

"De Laes." Handkerchiefs. Charles Goell, New York.

"Alreco." Cotton piece goods. A. L. Reid & Co., New York.

"Aviator." Hosiery. Walter Wesendonck, New York.

"Peplum." Silk piece goods. Atuyer, Bianchini, Ferier & Co., Lyon, France.

"Snowflake." Handkerchiefs. Brown, Durrell Co., Boston, Mass.

"Snow White." Cotton knitted underwear. Darius D. Coldren, Schuylkill Haven, Pa.

"Nesco." Knitted shirts, drawers and hosiery. M. E. Smith & Co., Omaha, Neb.

"Stan." Hosiery. John I. Holder, New York.

"Excelsior." Silk bolting cloth. Swiss Silk Bolting Cloth Mfg. Co., Zurich, Switzerland.

"Valentines." Silk goods in the piece. The Valentine & Bentley Silk Co., Newton, N. J.

"Morelle." Knit underwear. Lax & Strauss, New York.